State of New Hampshire

Water Monitoring Strategy

NEW HAMPSHIRE DEPARTMENT OF
Environmental Services

September 2005

R-WD-05-27

State of New Hampshire
Surface Water Monitoring and Assessment Program

Michael P. Nolin
Commissioner

Michael J. Walls
Assistant Commissioner

Harry T. Stewart
Director, Water Division

Paul M. Currier
Administrator, Watershed Management Bureau

Prepared by:
Gregg Comstock, P.E.
NHDES Watershed Management Bureau

Printed on Recycled Paper

TABLE OF CONTENTS

LIST OF TABLES

1 PURPOSE

This strategy specifies a process for determining water monitoring data required to address New Hampshire's water management needs. It describes a vision for collection, management, and analysis of water data in a way that supports public management decisions about protection and restoration of our water resources. This first edition focuses on surface water quality data for all waterbody types, with an emphasis on water quality assessment under the Clean Water Act (CWA). We expect that future editions will incorporate other objectives, including groundwater and flow monitoring.

The purpose of developing this strategy is to provide a vehicle for planning and coordination among all organizations that collect water data in New Hampshire – federal, state, and local government, as well as non-government and academic. It fulfills the EPA requirement for a Strategy to implement the Elements of a State Water Monitoring and Assessment Program (USEPA, 2003) in the context of surface water quality assessment and reporting under sections 305(b) and 303(d) of the Clean Water Act. In a broader context, the strategy aims to provide unifying concepts, purposes, and methods for all who collect water quality data, leading to more efficient water monitoring, more available data, more complete and informed analysis, and ultimately better public decision-making about actions affecting water resources.

The strategy is underlain by three principles:

1) Water management decisions should be data-driven, and framed on a watershed basis.
2) The purpose for collecting water data should be clearly understood.
3) Water data should be accessible and interoperable, with documented data quality and metadata.

2 MONITORING PROGRAM STRATEGY

This chapter discusses the underlying principles of New Hampshire's water monitoring program, and introduces the essential strategic elements to implement these principles. It includes a summary of the current status of these elements. Subsequent chapters fill in the details, and the tasks necessary for implementation. Sections 2.1 through 2.3 discuss the underlying principles of the strategy, and the following sections discuss implementation.

2.1 Water quality management decisions should be data-driven, and framed on a watershed basis

Too often, water quality management decisions are made without clearly framing the issue or question, and without a good understanding of the problem, even if pertinent monitoring data already exist. Data-driven decision making is a structured process for informing management decisions by analysis of pertinent monitoring data.

As our ability to collect water monitoring data increases with advancing technology, the gap between monitoring data collection, analysis, and public decision making tends to widen. To address this gap, DES is implementing a data-driven decision making paradigm, which is based on the Data Quality Objectives process developed by EPA (USEPA, 2000). We are encouraging other agencies and organizations to partner with us in its use. Using this concept, the entire strategic plan for monitoring becomes a dynamic composite of objectives as the seven steps of the DQO process frame, quantify, and analyze key management questions. These steps are outlined below.

Step 1: State the Problem Identify the water quality issue, problem, or management question that needs to be addressed. This is usually a short, concise, written statement.

Step 2: Identify the Decision Further specify the problem by a concise statement of the decision that needs to be made to address the problem. A particular issue may have several decisions. Again this is usually a short, concise, written statement.

Step 3: Identify Inputs to the Decision Quantification starts with this step, which has three parts. First, make a conceptual model that describes how the essential principles of physics, chemistry, biology, sociology, government machinery, and whatever else is applicable work relative to the issue, interact. The model identifies the important parameters of the interactions. This short, concise, written statement is important because it forms the foundation for common understanding of the issue among often diverse stakeholders. Second, describe a quantitative model or analysis that will inform the decision of step 2. This part always has equations in it. Third, identify the kind and amount of data required to feed the analysis, i.e., to assign number values to the variables in the equations.

Step 4: Define the Study Boundaries This important step is easy to overlook, but it is important, to bound the extent of the problem statement. Study boundaries are preferably watershed boundaries but may also be political boundaries.

A watershed is defined by the boundaries of natural water flows. It is a land area from which all water drains to the same place. Human activities that affect water quality and quantity affect all the downstream waters in the same watershed. Watersheds can range in size from a few to many thousand acres, depending on how a particular management question is framed. Likewise, constituencies with vested interests in water quality management decisions can range from local watershed organizations and municipal land use boards to Congress and national policymakers. Because each watershed is unique in size, shape, and other attributes, there are no generic water quality management decisions.

To provide a watershed basis, DES is developing a statewide GIS-based waterbody catalog. All waterbodies in the state will be cataloged using the National Hydrography Dataset (specifications may be found at http://nhd.usgs.gov/), with the associated watershed delineated using the Hydraulic Unit Code system. The catalog is a concise association of waterbodies and watersheds with water data and watershed attributes, for Clean Water Act water quality assessment as well as for framing local and state water management decisions.

The catalog has been completed at 1:100,000 scale for all waterbody types except wetlands. It includes waterbody (assessment unit) attributes needed for 305(b) reporting. This catalog had a total of 5,294 assessment units as of the 2004 assessment. Work is in progress to create NHD coverage at 1:24,000, and to build a comprehensive waterbody catalog at this scale that will include all waterbody types, as well as many additional waterbody attributes. The 1:24,000 catalog will include both wetlands and groundwater. Appendix 1 describes the waterbody catalog in more detail.

Step 5: Develop a Decision Rule Although this is a separate step in the DQO process, it really is a part of Step 2. The decision rule should be applied using the results of the analysis specified in step 3.

Step 6: Specify Limits on Decision Errors How good does our quantitative understanding of the problem (Step 3) need to be to use the Decision Rule (Step 5)? The error limits in both the analysis and the data need to be estimated. This is done in a documented Quality Assurance process, with documented Quality Assurance Program Plans (QAPP)

Step 7: Optimize the Design for Obtaining Data Describe the details of what data are to be collected where, using what methods, and how they will be used in the analysis. This and Step 6, combined with a summation of Steps 1-5, constitute a QAPP.

2.2 The purpose for collecting water quality data should be clearly understood

There is too often a rush to collect data without first performing the Data Quality Objectives steps. This can be true even if there is a QAPP that describes sample collection, lab analysis, and limits of error in great detail. A good rule of thumb is “Don’t collect data if you don’t know what you’re going to do with it”. Knowing what to do with the data comes from conscientiously going through the DQO process.

Early in implementation of this strategy, DES intends to implement a structured DQO process for our water quality monitoring programs. The DQO process, consistently applied, will link the objectives of this strategy concisely with the water monitoring data needed to fulfill them. This is further described in chapter 3 - Monitoring Objectives and chapter 4 – Monitoring Design.

2.3 Water data should be accessible and interoperable, with documented data quality and metadata

Accessible data are readily available in electronic form to anyone conducting an analysis. Interoperable data have sufficient metadata so that anyone can determine if the data meet error limit requirements and are useful for their analysis. We are increasingly aware that monitoring data recorded in the bare form of “Station, date, result” is not very useful even to the originator, let alone to anyone else. A QAPP describes targets for data quality. What these targets are and whether or not they are met must be documented with the bare data. Additional metadata is essential if the data are to be used by anyone but the originator.

DES is building an electronic statewide Environmental Monitoring Database (EMD) to warehouse and provide public access to all environmental monitoring data collected by DES, as well as data collected by cooperating agencies and organizations. In addition, we are participating in the Gulf of Main Ocean Data Partnership, whose goal is to create a network of accessible, interoperable data managed by many organizations throughout the Gulf of Maine.

As described further in chapter 7.1, EMD is now fully operational for physical and chemical water quality parameters and can be queried from the internet. It is compliant with STORET and can transmit data to the national STORET warehouse. EMD will soon also be compliant with the recently promulgated ESAR standards for data and metadata. We cooperate with several organizations outside of DES to manage and provide public access to their data, including volunteer groups, the University of New Hampshire, and a few municipalities. The list is growing all the time.

2.4 A New Hampshire Monitoring Network

Implementation of these underlying principles in all New Hampshire water monitoring efforts depends on a statewide mechanism for coordination, communication, collaboration, and data sharing among all entities that collect, manage, or use monitoring data. For this mechanism, we propose to create a state water monitoring council, the New Hampshire Monitoring Network. We will initiate formation of the network and provide core staff for its support. The network's purpose will be to join the individual efforts of the disparate agencies and organizations that now collect monitoring data into a coordinated, integrated, and mutually understood process for data-driven decision making, using the principles described above. We have committed to forming the network in FY 06, as a participant with EPA and USGS in a pilot project to integrate USEPA and USGS water quality monitoring and assessment activities in New Hampshire and New England.

3 MONITORING OBJECTIVES

Monitoring objectives are essential. They are the first two steps of the DQO process, without which no monitoring should proceed. The development of objectives and the DQO process leading to monitoring programs and projects to support them should be a continuing activity within the context of this strategy. The interim objectives in Table 1 are the ones we have initially identified. Numbered objectives are either required by EPA for Clean Water Act reporting purposes, or they are the basis for ongoing surface water quality monitoring at DES. Lettered objectives are draft placeholders for inclusion in subsequent editions of the strategy. We expect this interim list to grow and be refined in subsequent editions.

Table 1 Interim Water Monitoring Objectives

Objective #	Description	CWA Section
1	Determining surface water quality standards attainment	305(b), 314
2	Identifying impaired surface waters, waters meeting standards, and high quality waters	303(d)

3	Assessing surface water quality trends	305(b), 314
4	Support surface water quality modeling studies such as TMDLs and Diagnostic Feasibility Studies	303(d)), 314
5	Identifying causes and sources of surface water quality impairments	303(d), 305(b)
6	Supporting the evaluation of program effectiveness .	303, 305, 402, 314, 319
7	Supporting surface water compliance and enforcement Actions	
8	Investigating surface water quality complaints	
9	Establishing, reviewing, and revising surface water quality standards	303(c)
10	Supporting special research projects, including emerging public and environmental health issues	
11	Supporting the implementation of surface water quality management programs	303, 305, 402, 314, 319
12	Supporting protection for high quality surface waters under the surface water antidegradation policy	314, 303(c)
A	Supporting contaminated site remediation	
B	Providing data for dam management and operation	
C	Providing data for flood and drought control and prediction	
D	Providing data for water management plans for surface and groundwater use and dam operation	
E	Assessing groundwater quality for domestic water supply	
F	Providing data for source water protection for surface and groundwater supplies	
G	Assessing surface water impacts of groundwater and surface water withdrawals	

3.1 Objective 1: Determining surface water quality standards attainment

The CWA Section 305(b) requires states to report to EPA on the quality of all surface waters every two years. Specifically, 305(b)(B) requires a report on the extent to which all surface waters support aquatic life and recreation. A detailed description of water quality standards, designated uses, and assessments for the 2004 report may be found in the Consolidated Assessment and Listing Methodology (CALM) at http://www.des.state.nh.us/wmb/swqa/2004/pdf/CALM.pdf. A draft of the revised CALM for the 2006 report will be available by January 2006. In the meantime, changes being considered for 2006 are available at http://www.des.state.nh.us/wmb/swqa/docs/Guidance_for_Submittal_of%20Coments_on_the_CALM.pdf

It is immediately apparent that a census approach to meeting objective 1 is unworkable. Our current waterbody catalog contains 5,294 assessment units, and this does not include wetlands. The CALM requires multiple samples of core parameters to complete an assessment. Therefore we are adopting a stratified random sampling approach similar to that employed by EPA's EMAP program to meet objective 1 (http://www.epa.gov/bioindicators/primer/sampling.html). In this approach, New Hampshire's waters (assessment units) are first stratified into waterbody types. Within each type, a spatial randomization procedure is used to select a specified number (usually 50) of locations to sample for the core parameters needed to assess designated use support. From the proportion of sample results from these locations that indicate water quality supports the designated use, the expected proportion of all waters in the state where the designated use is supported can be estimated, within specified confidence limits (usually about 15%). This estimate fulfills the 305(b) objective of assessing all waterbodies.

Probabilistic monitoring does not, however, provide any information toward objective 2 – identifying impaired waterbodies. This is because the amount of data collected in each assessment unit does not meet minimum CALM requirements. Therefore it is neither useful for reporting to EPA under CWA section 303(d) nor for local watershed management decisions that require complete assessment of targeted waterbodies.

We propose to conduct probabilistic assessments of all New Hampshire surface waters, grouped into six strata by waterbody type. The probabilistic assessment will be repeated for each stratum every 10 years. Appendix 2 further describes the proposed probabilistic monitoring process. Because statewide probabilistic monitoring is not useful for state or local water resource management decisions, we will meet the minimum requirements set forth by EPA for statewide probabilistic monitoring, yet focus as much assessment effort as possible on objective 2. Appendix X further describes the proposed probabilistic monitoring process.

3.2 Objective 2: Identifying impaired waters, waters meeting standards, and high quality waters

Identifying which assessment units are meeting standards and which are not requires assessment of each AU in accordance with the CALM. Our experience in working closely with volunteer monitors is that, for the waterbodies they are interested in, local watershed monitors and stewards really want an assessment process that tells them if water quality is "really good", "so-so OK", "not too bad" or "really bad". So our strategy for objective 2 is to assess as many as possible of the waterbodies that people (represented in watershed organizations, volunteer monitors, academic institutions, conservation commissions and so on) care most about. We will identify these waterbodies by outreach and interaction with as many of these organizations as possible. We will present the waterbody catalog idea to them, get their help in revising and enhancing the catalog for their watershed so it is an accurate picture of the waterbodies they care about, and work with them to collect the data to assess the waters of most local importance on a prioritized basis.

We will develop a four-level assessment process that not only identifies impaired waters, but the four quality levels that watershed stewards need to inform their management decisions. This idea is an extension and adaptation of the biological condition gradient concept that is under development regionally for wadeable streams. Further, we are working with our Water Quality Standards Advisory Committee (WQSAC) to develop quantitative determinations for “high quality” or “tier 2” waters under the antidegradation policy. This will be the method for determining the “really good” water quality level.

Waterbodies in less populated watersheds often have no organized local stewardship or monitoring group. For these waterbodies, we will investigate development of modeling tools to infer assessment status from watershed characteristics that are available from existing GIS datasets or from remote sensing datasets. This is being investigated in a pilot project during FY 06 and 07 by EPA, USGS, and DES. The workplan for the project proposes to integrate USEPA and USGS water quality monitoring and assessment activities in New Hampshire and New England using New England Sparrow model inputs and statistical analyses on the New England Wadeable Streams dataset collected by Region 1 in cooperation with New England states.

DES is extremely fortunate to have two, very active volunteer monitoring programs; the Volunteer Lake Assessment Program (VLAP) and the Volunteer River Assessment Program (VRAP). Each program is administered by a DES coordinator and involves hundreds of dedicated volunteers who collect samples and conduct water quality measurements on regular basis. VLAP now includes 155 lakes and VRAP has volunteer monitoring groups on more than a dozen rivers. Additional information on these programs is available at www.des.state.nh.us/wmb. In addition, the University of New Hampshire (UNH) Cooperative Extension Service administers the Lay Lakes Monitoring Program where volunteers regularly collect samples on 50 to 60 lakes. We are working with UNH to foster better coordination, data sharing, and collaboration on sampling methods.

With the addition to DES of the NOAA-funded Coastal Zone Management Program in 2004, we now have a volunteer Marsh Monitors Program. The program currently monitors 9 coastal saltmarshes, focusing on documenting the success of restoration projects in effecting improvements to physical, chemical, and biological conditions.

Data collected by VLAP and VRAP were used in the 2002 and 2004 305(b)/303(d) Surface Water Quality Assessment. However, even with the use of the volunteer data, less than 13% of all rivers and less than 48% of all lakes were assessed for both primary contact recreation (swimming) and aquatic life use support in 2002 (www.des.state.nh.us/wmb/swqa).

With limited State staff and resources available for monitoring field work, DES intends to explore ways to expand and better integrate volunteer monitoring to achieve Objective 2 as well as the monitoring objectives of the volunteers. DES will aggressively pursue building statewide capability for enhanced volunteer monitoring. This will include seeking additional staff so that we can provide direct technical support to more volunteer groups, making EMD easy to use for organizations outside DES, and better coordination with organizations that have their own monitoring capabilities, such as UNH Lay Lakes Monitoring Program, GLOBE, Plymouth State University Center for the Environment, UNH Jackson Lab, Lake Sunapee Protective Association, and others. The New Hampshire Monitoring Network will be an important communication tool for this effort.

In summary, DES will work to maximize the number and decision-making value of targeted assessments for New Hampshire waterbodies. The primary vehicle for this will be the nascent New Hampshire Water Monitoring Network.

3.3 Objective 3: Assessing water quality trends

Assessing water quality trends is at least as important as determining designated use support. This is true for two reasons:

> First, the antidegradation policy that is a required element of water quality standards requires "Where the quality of the waters exceed levels necessary to support propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality shall be maintained and protected unless….". Applying this requirement to maintenance of water quality means that the trend in water quality over time is either zero or in the direction of better water quality. This can only be objectively determined by trend analysis.

> Second, changes in land use and in the characteristics of the landscape have great potential to alter water quality and quantity. Documentation of these effects using trend analysis provides the rational basis for implementation of best management practices to mitigate water quality impacts from land use change.

Over the past two years, New Hampshire Estuaries Project (NHEP) has conducted comprehensive statistical analyses to determine the presence of significant trends in estuarine water quality, as well as to estimate the power of the data to detect trends for different sampling frequencies, given the variability for each parameter. These studies have shown that power analyses are extremely useful for optimizing trend monitoring sampling designs.

Based on the knowledge gained in the estuaries, DES is in the process of conducting similar trend and power analyses on its lakes and rivers data. It is expected that these analyses will also result in more efficient trend monitoring designs for these waterbody types. Once these analyses are complete, appropriate changes will be incorporated into the monitoring strategy.

Discussions about use of trend analysis are also in progress in a WQSAC workgroup for lake nutrient criteria. The idea has been proposed that determination of a declining water quality trend for a lake, at a specified confidence level, should be a basis for invoking the antidegradation policy for the lake watershed, and then formally requiring application of BMPs, perhaps even for existing development, to stabilize or reverse the trend. This concept is still in the development stage, but, if viable, has obvious applicability to other waterbody types.

3.4 Objective 4: Support water quality modeling studies such as TMDLs and Diagnostic Feasibility Studies

DES has mature in-house programs for conducting both river TMDLs (mostly for dissolved oxygen deficit) and lake Diagnostic Feasibility Studies (DFS) (mostly for phosphorus). We have also recently performed bacteria TMDLs for several coastal assessment units. We expect to maintain this capability, and expand our staff and in-house production of TMDLs and DFSs as resources become available. We anticipate that there will be increased interest by municipalities and developers in conducting TMDLs or DFSs, when these studies are needed to support discharge limits for either point or nonpoint sources that are required for design of new or upgraded facilities to serve our growing population. In addition to in-house capability for production of DFSs and TMDLs, we will review, approve, and submit to EPA for approval, studies conducted by others and their consultants for water quality load allocations.

3.5 Objective 5: Identifying causes and sources of water quality impairments

Once an assessment unit is listed as impaired, a follow-up process should be put in place to understand the causes and sources of the impairment. Sometimes, for AUs on the 303(d) list as impaired by pollutants, a TMDL or DFS is the appropriate process. For many other impaired AUs, including for example beaches, or wadeable streams with biological impairment based on macroinvertebrate metrics, a source investigation or stressor analysis is the best way to figure out what needs fixing. DES is in the process of developing structured processes for these investigations, consistent with the underlying principles of this strategy. We have several bacteria source identification studies underway for fresh water beaches, and our first formal stressor analysis is in progress. These studies require monitoring activities similar to but usually smaller in scope than a formal TMDL or DFS.

3.6 Objective 6: Supporting the evaluation of program effectiveness

Currently, 319 restoration project grantees are required to document the effectiveness of projects for which they receive grant funding. For many of these, monitoring is conducted for this purpose. Similarly, implementation plans for TMDLs often employ adaptive management strategies in which loads are allocated after a first round of modeling and monitoring is used to track whether or not the initial allocations are successful in attaining water quality standard. Failure to meet standards warrants additional allocation and implementation efforts are. This process has been employed cooperatively by NH, Maine, and EPA on the Salmon Falls River. TMDLs are in progress for several segments of the Contoocook River, and we expect that the implementation plan for this river will also include adaptive management.

3.7 Objective 7: Supporting Compliance / Enforcement Actions

See the discussion under objective 8.

3.8 Objective 8: Investigating water quality complaints

DES maintains an active program for water quality complaints. Complaints received are logged and assigned to a staff person for follow-up. Responsibility for complaint response is distributed throughout DES, and each complaint is typically assigned to a person in a program that is closely related to the complaint. Coordination among multiple DES program is sometimes needed. Most water complaints are tracked in a database, from receipt to resolution. Monitoring done during complaint investigations is entered into EMD, and linked to a complaint database that tracks correspondence and other complaint-related information. These data are used in the 305(b) assessment process.

If enforcement (called “compliance assurance”) is needed, legal staff becomes involved. Monitoring in support of enforcement is documented in the same manner as complaint monitoring.

Enhancements to the complaints database, and comprehensive staff training in documentation of complaint response are planned for the future.

3.9 Objective 9: Establishing, reviewing, and revising water quality standards

Since 2000, DES has been working on developing numeric criteria and quantitative translators for narrative criteria. We formed a multi-stakeholder Water Quality Standards Advisory Committee (WQSAC) to help with the process. Our basic approach is that all evaluation of designated use support should use quantitative analyses that are as specific and precise as possible. Advances in monitoring and data management technologies and methods make it ever more possible to develop and use quantitative analyses based on monitoring data.

We are currently working on:

- √ nutrient criteria (this will likely be a translator of narrative criteria
- √ temperature criteria for aquatic life use in wadeable streams
- √ antidegradation high quality waters determination
- √ quantification of “none unless naturally occurring” narrative language for class A waters.

3.10 Objective 10: Supporting special research projects, including emerging public and environmental health issues

DES participates in special research projects that require data. Although these monitoring efforts have often been separate from those related to Clean Water Act Reporting, we intend to include these projects under the strategy, using the DQO process for planning and design of monitoring that supports special projects. We include investigation of emerging water issues under the special research project objective.

3.11 Objective 11: Supporting the implementation of water management programs

DES will initiate strategic planning for monitoring in support of water management programs. This will involve identification of water management programs and determination of the need for monitoring data to establish program effectiveness. Any monitoring will use the DQO process to develop and implement a monitoring plan.

3.12 Objective 12: Supporting protection for high quality waters

High quality waters are the “really good” category of water quality under our proposed four-level assessment scale. In Clean Water Act jargon, they are called “tier 2 antidegradation waters”. DES is working with the WQSAC to develop statistically sound, quantitative procedures for determining high quality waters on a parameter by parameter basis. Monitoring designs, which will adhere to the CALM,. will be modified as detailed analyses are formulated. Once an AU is determined to be of high quality, then trend analysis (see objective 3) will be used to determine if there is ongoing degradation.

4 MONITORING DESIGN

We will use the DQO process described in chapter 2 to develop all monitoring designs. This is a structured, documented process for identifying the analyses needed to fulfill the objective and the data needed to feed the analysis. Relevant data includes parameters as well as locations, quality assurance, and other metadata. This process results in a specific monitoring design tailored to the analysis that meets the objective. For projects with individual QAPPS, this process will be documented in the QAPP. For projects that use generic program QAPPS, a separate project-specific scope of work and monitoring design report will be written.

Using this approach, we will have not one monitoring design, but a documented collection of designs developed under the DQO process, each of which supports a particular analysis to inform a particular problem or issue. The paragraphs below summarize our general plans for monitoring design, by objective.

4.1 Objective 1: Determining surface water quality standards attainment

The probabilistic monitoring design for objective 1, which fulfills the CWA 305(b) requirement for state assessment of all waters – has been summarized in section 3.1.

4.2 Objective 2: Identifying impaired surface waters, waters meeting standards, and high quality waters

The targeted monitoring design for objective 2, which fulfills the CWA 303(d) requirement for identification of impaired waters, is also a foundation element of our Watershed Approach (Appendix 3). The general design is described in section 3.2. Specific designs will be developed for each watershed of concern, with associated QAPPs or monitoring plans that reference existing program QAPPs. The CALM provides essential design elements for surface water assessments, including core parameters, minimum number of samples, among others.

4.3 Objective 3: Assessing surface water quality trends

DES will use, and encourage others to use, well-documented statistical techniques for trend analysis. There are a variety of standard texts available. The ones most often referenced by DES are (Gilbert, 1987) and (Helsel and Hirsch, 1991)

4.4 Objective 4: Support surface water quality modeling studies such as TMDLs and Diagnostic Feasibility Studies

Each water quality modeling study will have its own QAPP, which may contain its own a monitoring design. Otherwise, it must include a documented scope of work that contains a monitoring design based on the DQO process and references an approved generic QAPP.

4.5 Objective 5: Identifying causes and sources of water quality impairments

As in objective 4, each water quality modeling study will have its own QAPP, which may contain its own a monitoring design. Otherwise, it must include a documented scope of work that contains a monitoring design based on the DQO process and references an approved generic QAPP.

4.6 Objective 6: Supporting the evaluation of program effectiveness

As in objectives 4 and 5, each water quality modeling study will have its own QAPP, which may contain its own a monitoring design. Otherwise, it must include a documented scope of work that contains a monitoring design based on the DQO process and references an approved generic QAPP.

4.7 Objective 7: Supporting Compliance / Enforcement Actions

See the discussion under objective 8.

4.8 Objective 8: Investigating water quality complaints

Monitoring for complaint investigation and compliance actions is almost always source identification and problem documentation. A formal DQO process is not used for each individual complaint or enforcement action, but the principles are followed. Generally, the investigator must develop and implement a monitoring plan that answers the questions: “Is water quality messed up as alleged?”, Why?” and “Who did it?”. The monitoring data is then used to determine if action is needed and, if so to help formulate an action plan or enforcement as appropriate.

4.9 Objective 9: Establishing, reviewing, and revising water quality standards

To date, most projects for water quality standards review and revision have involved fresh analysis of existing data. This has been greatly facilitated by the EMD and Assessment Database (ADB) which allow us to easily query data associated with each AU, parameter by parameter. We will continue to work with WQSAC on development of quantitative means of applying water quality standards. For projects that require collection of new monitoring data, each project will have its own QAPP that contains a monitoring design, or a documented scope of work that contains a monitoring design based on the DQO process and references an approved generic QAPP.

4.10 Objective 10: Supporting special research projects

As in objectives 4, 5, and 6 each special research project will have its own QAPP that contains a monitoring design, or a documented scope of work that contains a monitoring design based on the DQO process and references an approved generic QAPP.

4.11 Objective 11: Supporting the implementation of water management programs

As in objectives 4, 5, 6, and 10 each water management program that requires monitoring data for implementation will have its own QAPP that contains a monitoring design, or a documented scope of work that contains a monitoring design based on the DQO process and references an approved generic QAPP.

4.12 Objective 12: Supporting protection for high quality waters

The CALM will be the basis for monitoring designs to support protection of high quality waters. This will be modified as detailed analyses are formulated in consultation with WQSAC. Once an AU is determined to be high quality, then trend analysis will be used to determine if there is ongoing degradation. Monitoring designs for trend analysis will follow those for objective 3.

5 CORE AND SUPPLEMENTAL PARAMETERS

Core and supplemental water quality parameters and criteria used to assess each designated use under objective 2 may be found in the CALM. This document is available on the DES website at www.des.state.nh.us/wmb/swqa. Additional supplemental indicators used by the New Hampshire Estuaries Project (NHEP) are listed in the NHEP Monitoring Plan (http://webster.state.nh.us/nhep/Monitoring?monitoring.htm).

Core and supplemental parameters are not generically applicable to the other objectives.

6 QUALITY ASSURANCE

As stated in the third underlying principle, all monitoring data should be of documented quality and have associated metadata. Although partner organizations with DES may have their own procedures for quality assurance, the unifying principles will be the same – documented data quality and other essential metadata, accessible in the same manner as the monitoring data itself. A quality assurance project plan (QAPP) is a value-added process to document quality assurance on a project basis. The sections below describe the department's quality assurance process.

6.1 Quality Management Plan (QMP)

For monitoring conducted by the department, DES maintains an EPA-approved Quality Management Plan (QMP). This document, prepared in accordance with *EPA Requirements for Quality Management Plans (QA/R-2)* (March 2001), describes the department's organizational structure, policy and procedures, functional responsibilities of management and staff, lines of authority, and processes for planning, implementing, and documenting all monitoring activities conducted under the our quality system.

The DES QMP and Environmental Data Quality Policy (revised December 2004) emphasize DES's commitment to data quality. The most recent QMP for DES was first approved by EPA in June 2001. Full QMP submittals are required every five years, with the next one due in July 2006. Each year, however, DES reviews its QMP and submits the results of this annual review to EPA. The current version of DES's QMP (i.e., Revision #5, March 2005) is located at: www.des.nh.gov/pdf/NHDESQMP_Rev5_03.04.05.pdf. In addition to a full review of the QMP, programs that collect environmental data also conduct required annual QA System Self-Assessments and report the results to the DES QA Manager.

In March 2005, EPA New England Quality Assurance staff conducted a Management System Review of DES's Quality Assurance System. Per EPA's findings, "DES has implemented an effective and robust quality system in compliance with EPA Financial Assistance Regulations and the NHDES Performance Partnership Grant conditions."

6.2 Quality Assurance Project Plans (QAPPs)

Quality Assurance Project Plans (QAPPs) document the following for specific elements:

- ✓ Problem definition, analysis selection, and data needs
- ✓ Project planning
- ✓ Sample or monitoring data collection and analysis
- ✓ Quality assurance and quality control activities
- ✓ Data management activities
- ✓ Specifics of analysis procedures and application of the decision rule

In accordance with the EPA-approved QMP, all EPA-funded federal projects are required to have QAPPs that follow federal guidelines (e.g., "R-5") in place prior to monitoring. For non-EPA, federally-funded projects and state-funded projects, the DES QMP specifies that these projects must also have quality assurance/quality control documents in place although they do not necessarily have to follow EPA guidelines. The DES QA Manager regularly tracks the status of all pending and completed/approved QAPPs. This QAPP Inventory is submitted quarterly to EPA Quality Assurance. In addition, the EMD can support electronic filing and storage of QAPPS for easy project documentation to future secondary data users.

DES intends to provide technical assistance for QAPP preparation, both internally and to outside organizations, as an element of strategy implementation. Whatever the organization and management issue to be addressed using the guiding principles of this strategy, a well-written QAPP or a scope of work that builds on generic program QAPPs is an excellent vehicle for communication and coordination among all project participants. Although not absolutely essential, DES desires that QAPPS be filed electronically in EMD for easy project documentation to future secondary data users.

7 DATA MANAGEMENT

Effective data management is the key to implementing the third underlying principle of the strategy. i.e., water data should be accessible and interoperable, with documented data quality and metadata. There are three elements to our strategy for data management: 1) the New Hampshire Water Monitoring Network; 2) the Environmental Monitoring Database; and 3) web-based data trading agreements. As discussed in section 2.4, the New Hampshire Water Monitoring Network will provide the organizational context for communication and collaboration among all organizations that collect water data in New Hampshire. This network will inform each organization of the others' data and forge common understandings of how to share those data. For organizations that do not have sophisticated information technology capability, DES offers EMD as a way to document, share, and archive data. For organizations with information technology capability, web-based data trading agreements with DES and others, using standard protocols like XML, will provide these functions.

7.1 DES Environmental Monitoring Database and STORET

DES has recently developed an Oracle-based Environmental Monitoring Database (EMD) to store water quality data. We are currently in the process of migrating all surface water quality data within the DES Watershed Management Bureau into the EMD. In addition, other bureaus within DES have also committed to storing their water quality data in the EMD, and efforts are underway to partner with outside organizations to import their surface water quality data into the EMD. Some partner organizations to date include University of New Hampshire Lay Lakes Monitoring Program, Great Bay Coast Watch, and the Upper Merrimack River Local Advisory Committee. The goal is to get as much New Hampshire water quality data stored into the EMD as possible. Having the data in one common database will make it more accessible to DES and the public, and will greatly facilitate data analysis and assessments.

The EMD was purposely designed to be compatible with EPA's STORET database. The process for getting data into STORET involves importing data from the EMD into the

DES local version of STORET using the STORET Import Module (SIM). A dump file is then created which is sent to EPA to upload into the National STORET warehouse. By April 1, 2006, DES plans to send another dataset to EPA for input into National STORET. Once in the National STORET, the data is available to the public on the Internet. The EMD information is also available on the DES One-Stop web sitehttp://des.nh.gov/OneStop/Environmental_Monitoring_Query.aspx .

7.2 EPA Assessment Database (ADB)

In 2002, DES was one of the first states in the nation to electronically submit its 2002 Section 305(b)/303(d) assessment using the new EPA Assessment Database (ADB). DES is committed to using the ADB for future assessments.

The focus of the current ADB is on impairment status. Additional features need to be built into the ADB to track the status of any parameter regardless of whether or not it is causing impairment. Such information, for example, would greatly assist water quality managers in planning future monitoring efforts. DES hopes that EPA will continue to work with States to improve the ADB with the goal of making it a more useful water quality management tool.

7.3 Statewide Waterbody Catalog

The statewide waterbody catalog is described briefly in Section 2.1, step 4. This is a catalog of all the waterbodies of the state, based on NHD. The topological rules for the NHD directed drainage network, and the event theme process in ArcGIS are being used to divide all surface waters (and in the future, groundwaters as well) into Assessment Units (AUs). An AU is the basic unit of record for conducting and reporting water quality assessments. Event themes will also be developed for other attributes of importance to water resource management. These additional event themes will be tied to of the base NHD waterbodies and contain attributes such as Great Ponds, waters subject to the Shoreland Protection Act, Designated Rivers, and so on. An important aspect of the catalog is that it enables monitoring data stored in EMD to be linked to a particular assessment unit or any other attribute from the suite of event themes, greatly facilitating data retrieval for waterbody assessment and management. The waterbody catalog is discussed further in Appendix 1.

8 DATA ANALYSIS AND ASSESSMENT

Data analysis and assessment is the primary reason for monitoring. Objective 1 - Waterbody assessment – is the reason that much of our water data is collected. Whatever the designated use, watershed, or assessment unit, the question “Is the water quality OK?” is a pervasive management question. The CALM is the basic reference document for using data to answer it.

The first edition of the CALM was prepared for New Hampshire’s 2002 Section 305(b)/303(d) Surface Water Quality Assessment. The CALM was updated for the 2004 assessment, and is once again undergoing update for 2006. The purpose of the CALM is to describe, in detail, how surface water quality data are analyzed and how assessment decisions for 305(b) reporting and 303(d) listing purposes are made. Examples of topics addressed in the CALM include:

- √ Waterbody coverage, types and assessment units
- √ Designated uses
- √ Data sources
- √ Data quality
- √ Data age
- √ Core parameters
- √ Definition of independent samples
- √ Spatial coverage per sample site
- √ Minimum number of samples for various parameters
- √ Magnitude of exceedance criteria
- √ Specific assessment criteria for each designated use
- √ Section 303(d) listing and delisting
- √ TMDL priority ranking

A copy of the 2004 CALM is available at www.des.state.nh.us/wmb/swqa.

Assessment methodologies are likely to change as new information and assessment techniques become available. Consequently, DES will review and update its CALM a minimum of every 2 years. Periodic updates of the methodology should result in more accurate and reliable assessments, and therefore, better management of water resources in the future.

9 REPORTING

DES has an excellent track record of producing timely and complete water quality reports. We have three audience types: 1) EPA, Congress, and national decision-makers; 2) the New Hampshire Governor, Legislature, and state agency decision-makers; and 3) local municipal and watershed decision-makers. Each of these is an important constituency for this strategy. Examples include the following:

9.1 Reporting to EPA, Congress, and national decision-makers

9.1.1 Section 305(b) Reports and 303(d) Lists

According to federal regulations, Section 305(b) Reports and Section 303(d) Lists are due every two years. Prior to 2002, New Hampshire, like many other states, submitted separate 305(b) Reports and 303(d) Lists. In 2002, DES was one of the first states in the nation to use EPA's new Integrated Approach and Assessment Database (ADB) which allows States to satisfy 305(b)/303(d) requirements in one submission. The 2002 and 2004 Section 305(b)/303(d) Surface Water Quality Assessments for New Hampshire are available at www.des.state.nh.us/wmb/swqa. DES is committed to using the Integrated Approach and the latest improved version of the ADB for the next surface water quality assessment due on April 1, 2006, and for future reporting under the Clean Water Act. We are developing our own ADB enhancements in ORACLE that will automate much of the data-intensive assessment process, and document the data used as well as the assessment results. We encourage EPA to continue with aggressive development of ADB because we think it has great potential to make the Clean Water Act vision of useful, reliable roll-up of state assessment reports to a comprehensive national decision tool.

9.1.2 Section 314 Clean Lakes Reports

Section 314 of the Clean Water Act (1987 amendments), requires states to submit a biennial report on the status of lakes as part of the State's 305(b) Surface Water Quality report. Up to and including the year 2000, DES submitted narrative 305(b) reports which addressed Section 314 requirements (www.des.state.nh.us/swqa). In 2002, DES submitted its 305(b) assessment electronically using the new EPA ADB; no additional submittals were required by EPA. The next Section 305(b) assessment is due in 2006. For this and future assessments, DES will use the ADB and submit electronically.

9.1.3 Section 319 Nonpoint Source Reports

DES maintains an excellent nonpoint source website, which addresses Section 319 requirements (www.des.state.nh.us/was). Included on this site are Nonpoint Source Management Annual Reports, and information on how to apply for the following Section 319 grants:

- ✓ Watershed Assistance Grants
- ✓ Watershed Restoration Grants
- ✓ Small Outreach and Education Grants for Nonpoint Source Pollution.

Although many 319 projects do not include monitoring, QAPPs are prepared for those that do, and these will be guided by this strategy. Summaries of past and ongoing grant projects are included on the website http://www.des.state.nh.us/wmb/was/.

9.1.4 Section 406 BEACHES Act Reports

Section 406 of the Beaches Environmental Assessment and Coastal Health (BEACH) Act requires annual submittals of performance reports, financial reports and monitoring/notification reports. In the past, DES has reported to EPA's National Health Protection Survey of Beaches (www.epa.gov/waterscience/beaches/data.html). As a result of enhancements to EMD and development of a web-based XML node and trading partner agreement with EPA for BEACH data sharing, DES now reports coastal beach monitoring data to EPA's STORET warehouse and beach advisory data via XML data exchange to EPA's PRAWN database. Plans are underway to enhance the EMD so monitoring data can be exchanged with the EPA and other programs via the Water Quality Data Exchange XML schema in the future.

9.1.5 National Coastal Assessment

DES has partnered with EPA to conduct National Coastal Assessment (NCA) monitoring since the inception of the program in 2000. EPA's Coastal Condition Report integrates the work of DES, UNH Jackson Lab, and EPA Narragansett Lab into a comprehensive report. DES has used the NCA data for the 2004 305(b) report and the NHEP monitoring plan includes monitoring to keep data current in the future for both assessment and trend reporting.

9.1.6 TMDLs

TMDLs are intended to be quantitative watershed-level decision tools. Although the specific TMDL analyses do not inform national decisions, EPA keeps close count of the number of TMDLs produced, relative to the number of AUs on our 303(d) list. The level of effort to prepare a particular TMDL can range from small for a "paper" TMDL that is prepared only to meet the EPA targets for numbers of TMDLs produced, to large for a "real" TMDL that involves a calibrated model to allocate loads. Because of the overriding EPA interest in numbers, we will do our best to maximize production of paper TMDLs while continuing to produce some TMDLs of real value for watershed-level decision-making. The situation is somewhat analogous to the trade-off between probabilistic monitoring and targeted monitoring, except that probabilistic monitoring may have some real value for national level decisions, whereas paper TMDLs probably do not.

9.2 The Governor, Legislature, and state agency decision-makers

State law (RSA 485-A:4, XIV) specifies a biennial report to the governor and legislature on status and trends of surface water quality. These reports have historically been identical to the 305(b) report and submitted at the same time. They are available on the web at http://www.des.state.nh.us/wmb/swqa/

9.3 Local municipal and watershed decision-makers

Municipal and other local decision makers make the vast majority of management decisions that affect water resources at the watershed level. DES has provided interpretive water quality reports to both VLAP and VRAP volunteer monitoring organizations. These reports are specifically intended to inform local decision-making.

See http://www.des.state.nh.us/wmb/VLAP/2004/ and http://www.des.state.nh.us/wmb/VRAP/vrap.asp?theLink=data.

We plan to expand and enhance interpretive reporting to watershed-level decision-makers, both through the New Hampshire Monitoring Network as well as by building our capability to provide information and technical assistance to volunteer organizations.

10 PROGRAMMATIC EVALUATION

Programmatic evaluation aims to periodically evaluate how well the monitoring programs meet their objectives and to determine how any revisions should be incorporated into future monitoring.

For monitoring programs that support objectives deriving from the Clean Water Act, DES staff meet at least once per year to discuss monitoring priorities for the upcoming season and any changes that need to be made to the monitoring programs. Such changes may include, but are not limited to, different State or EPA priorities, areas where others, such as EPA, will assist with monitoring, protocols that need to be improved, and equipment needs.

For monitoring activities that directly support the 305(b)/303(d) consolidated assessment and listing process, the strategy will be reviewed every listing cycle in the context of CALM revisions for the upcoming list.

At a broader scale, we intend that this strategy shall be a living document, and that all parts of it shall periodically come under review and revision. This should happen at a minimum frequency of five years.

Self-assessments, as specified in individual program QAPPs, also function as program evaluations. That is, the QAPP for each program specifies the objectives and monitoring program necessary to meet those objectives. Following implementation of the monitoring program, a self-assessment is performed to see if the objectives have been met and if revisions are necessary. If the self-assessment shows a need for improvements, programmatic changes are incorporated into future QAPPs. Further, under the DES Quality Management Plan, the DES Quality Assurance Manager annually reviews each program's self-assessment and verifies that any proposed changes are implemented.

In addition, monitoring in tidal waters receives evaluation under the New Hampshire Estuaries Project (NHEP). In 1999, DES, with partial funding from the NHEP, hired a Coastal Scientist to coordinate all monitoring activities in New Hampshire estuaries. Monitoring activities under NHEP were to address objectives set forth in the NHEP Comprehensive Conservation and Management Plan (http://webster.state.nh.us/nhep/Mgtplan/mgtplan.htm). A Technical Advisory Committee (TAC) consisting of experts in estuarine monitoring was immediately formed to assist the Coastal Scientist. In 2003, a comprehensive monitoring plan for the estuaries was completed (http://webster.state.nh.us/nhep/Monitoring/monitoring.htm). It is expected that the monitoring plan, with feedback from the TAC and NHEP Management Committee, will be evaluated and updated on an annual basis. NHEP monitoring activities are fully coordinated with DES monitoring by the Coastal Scientist.

11 GENERAL SUPPORT AND INFRASTRUCTURE PLANNING

Traditional long term federal funding sources for monitoring and assessment include federal Clean Water Act Section 106 and 604(b) grants for rivers and streams, state general funds for lakes, and federal Coastal Zone Management and National Estuaries Program funds for tidal waters. These sources have essentially stayed level over the last few years. Meanwhile salaries and benefits, as well as laboratory analysis costs, continue to increase, resulting in less actual monitoring activity on a per site visit basis.

In FY 03-05 DES has been able to maintain its base monitoring and assessment programs for rivers and streams by supplementing long term funding sources with PPG carryover funds from previous grant years and by applying for short term competitive funds such as Section 104(b) (3) grants. After FY07, however, it is projected that carryover money will be essentially exhausted. In order to maintain existing levels of monitoring effort, DES will need to become more efficient by reducing staff costs per site visit, and secure additional funding. We will work with ASIWPCA, ECOS, other states and EPA to present the needs to Congress for federal budget action. We will also explore state and watershed-based funding possibilities, as is presently being done, for example by our Shellfish Program.

11.1 Needs estimation

We have estimated staff and funding needed for implementation of Clean Water Act objectives: 1-5 and 9 in Table 1, as described in previous chapters, using a spreadsheet estimator for staff and funding that is organized around the program/project/activity/result schema of STORET and the EMD. This estimator will be equally useful for estimating support and infrastructure for other objectives, because this schema is being implemented for environmental monitoring (not just water) department-wide. Appendix 5 contains tables showing the results from the spreadsheet estimator with the values used for the estimate.

11.2 Methodology

For FY 2004 and 2005, DES has records of staff effort and other monitoring costs, as well as records of the monitoring results obtained from this effort. Results are cataloged in the EMD by program and project. We have records of staff, analytical, and related costs for these same years, from our ledger system and from our timesheet system. From these records we can estimate the staff effort and cost for producing a monitoring result in EMD for the various existing programs and result types. These estimates (by site visit/result) of staff effort and cost can be used to estimate future program needs to implement the strategy. Ancillary costs are estimated in the same manner.

11.3 Needs

Tables showing staff and funding needs to implement our strategy are provided in Appendix 4. Table 4.1 summarizes resource needs for 2006 (Year 1), 2007 (Year 2) as well as for a year with the maximum expected annual costs and staff requirements (in 2005 dollars) assuming all projects to fully implement the strategy are funded (i.e, the Peak Year). Resource needs were calculated separately for three separate strategy elements: 1) monitoring and QA/QC; 2) data management; and 3) data analysis or assessment and reporting.

Budget assumptions are:

- √ Available funding from existing sources for all scenarios was set equal to 2006 expenses.
- √ Expenses for element 1) (monitoring and QA/QC) include all time (salary and benefits) and expenses expected to be incurred by DES for planning, QAPP preparation, training and motivating volunteers, equipment maintenance and

purchase, supplies, travel, DES lab costs, related contract costs, sampling, and time spent by monitoring staff on data QA/QC and input into the EMD.

√ Expenses for element 2) (data management) include all time (salary and benefits) and expenses expected to be incurred by DES for routine cleanup and checking of new data in the EMD, for helping organizations outside of DES with getting their data into the EMD, and for updating the EMD to satisfy customer needs (i.e., creation of special reports or improvements such as a module to accommodate biological data). Associated training, supplies, travel, and related contract costs and also included.

√ Expenses for element 3) (data analysis and reporting) include all time (salary and benefits) and expenses expected to be incurred by DES for preparation of the 305(b)/303(d) Integrated Report, report to the legislature, as well as VLAP and VRAP reports. This includes updates of the Consolidated Assessment and Listing Methodology (CALM), assessment and input of data into the EPA Assessment Database, and maintenance of assessment GIS coverages based on the National Hydrography Dataset (NHD), and preparing the volunteer monitoring reports.

√ Expenses do not include the cost of office space for new staff.

Table 2 shows estimated staff and funding needs.

Table 2: Summary of Staff and Funding Needs

Element	2006 (Year 1)				Peak Year (in 2005 dollars)			
	Total Cost	Available Funds	Surplus / Deficit	Total # Staff Required (New Staff)	Total Cost	Available Funds	Surplus / Deficit	Total # Staff Required (New Staff)
# 1	$2.17 M	$2.17 M	$0	24.0 (6.3)	$3.06 M	$ 2.17 M	($0.89 M)	33.8 (15.5)
# 2	$0.22 M	$0.22 M	$0	2.5 (0.0)	$0.34 M	$0.22 M	($0.12 M)	4.5 (2.0)
# 3	$0.14 M	$0.14 M	$0	1.6 (0.0)	$0.21 M	$0.14 M	($0.07 M)	2.6 (1.0)
TOTAL	$2.53 M	$2.53 M	$0	28.1 (6.3)	$3.61 M	$2.53 M	($1.09 M)	40.9 (18.5)

NOTES:

1. Element # 1 = MONITORING AND QA/QC
   Element # 2 = DATA MANAGEMENT
   Element #3 = ASSESSMENT OR ANALYSIS AND REPORTING.
2. M = Million

In 2006, DES expects to spend approximately $2.53 M on all three CMS elements (monitoring and QA/QC, data management and assessment/ reporting). This effort will require approximately 28.1 full time equivalent (fte) staff of which, 21.8 fte are existing and 6.3 fte are new (part time interns which are hired by DES every summer). Sufficient funds are available to cover expenses in 2006.

Columns in Table 3 for peak year costs show that approximately $3.61 M is needed on an annual basis to fully implement the strategy. Assuming that future funding from existing sources remains at 2006 levels, this results in a $1.09 M deficit. The peak year requires approximately 40.9 fte, of which approximately 18.5 would be new. This includes 10 new full time staff and 2.8 fte in additional part time interns to the 6.3 fte of part time interns which are currently hired each summer. Projects requiring additional full time staff for strategy implementation are shown in Table 4. All of these projects are currently functioning with no more than one full time staff member.

Table 4: Projects Requiring Additional Staff for Strategy Implementation

# of New Full Time Staff	Project
2	Ambient River Monitoring Programs (ARMP and E_ARMP_BIO)
2	TMDL programs (TMDLR1 and E_CLNLK)
2	Volunteer Lake and River Assessment Programs (VLAP and VRAP)
1	DES Limnology Center (SUP_LIMNO)
2	Data Management (SUP_DATAQA)
1	Assessment and Reporting (SUP_ASSMT1)

Vehicles for transportation to sampling events are a major additional equipment need. The Peak Year scenario includes 3 vehicles. Other major equipment needs in the future include datasondes and biomonitoring equipment.

In summary, we estimate that full implementation of the New Hampshire Water Monitoring Strategy to fulfill Clean Water Act-related objectives (1-5 and 9) will require approximately 10 new full time staff positions, and $1.1 M in new funding.

12 REFERENCES

Gilbert, 1987. Gilbert, Richard O., Statistical Methods for Environmental Pollution Monitoring, Van Nostrand Reinhold, 1987

Helsel and Hirsch, 1991. Helsel, D.R., and R.M. Hirsch, Statistical Methods in Water Resources, Techniques in Water Resources Investigations of the United States Geological Survey, Book 4, Chapter A3, USGS, 1991

NHDES, 2001a. New Hampshire Department of Environmental Services, Quality Assurance System, Implementation Guidance for Program Managers, November, 2001.

NHDES, 2003. 2002 Section 305(b) and 303(d) Consolidated Assessment and Listing Methodology and Comprehensive Monitoring Strategy. New Hampshire Department of Environmental Services. September 2003. NHDES-R-WD-02-11.

USEPA, 1997. Guidelines for Preparation of the Comprehensive State Water Quality Assessments (305(b) Reports) and Electronic Updates. U.S. Environmental Protection Agency. EPA -841-B-97-002A.

USEPA, 2003. Elements of a State Monitoring and Assessment Program. U.S. Environmental Protection Agency. EPA 841-B-03-003.

USEPA, 2000. Guidance for the Data Quality Objectives Process. (EPA QA/G-4), U.S. Environmental Protection Agency. EPA/600/R-96/055

USEPA, 2002. EMAP Research Strategy. U.S. Environmental Protection Agency, Office of Research and Development, Research Triangle Park, NC. June 2002. 78 pp. EPA/620/R-02/002.

NHDES, 2001b. Quality Management Plan

APPENDIX 1 – COMPREHENSIVE WATERBODY CATALOG

An interim Waterbody catalog has been built at 1:100,000 scale for all waterbody types except wetlands. The 1:100,000 scale National Hydrography Dataset (http://nhd.usgs.gov/) provides the framework for tracking the spatial extent of a given waterbody with custom lines and polygons added where water quality data is available but the 100k NHD is lacking features. The discrete waterbody units for the catalog are the assessment units needed for 305(b)/303(d) reporting. The Assessment Units are synonymous with the Waterbody ID within the Environmental Monitoring Database (EMD) and within the EMD waterbody attributes (legislative classification, size, fishery type, public water supply,…) are tracked.

Work is in progress to create NHD coverage at 1:24,000, and to build a comprehensive waterbody catalog at this scale and will include all waterbody types, as well as many additional waterbody attributes. The new catalog will be comprised of layers of attributes tied to the NHD. Simultaneously, water quality stations will be tied to the NHD. Tying site locations to the NHD will support dynamic relationships between databases by way of route events. This will be a more efficient and accurate way to allow for updates to stations within the EMD. The new waterbody catalog will be a collection of defining attributes that can queried out at any scale be it a single impoundment, the entire Merrimack River or a whole watershed (Fig 1). By definition a waterbody may be described by any attribute of a point on a surface water. Any Waterbody can be defined by its Hydrologic waterbody type, legislative classification, public water classification, and so on. The Waterbody Definition is a conglomerate of all that we know about a particular surface water.

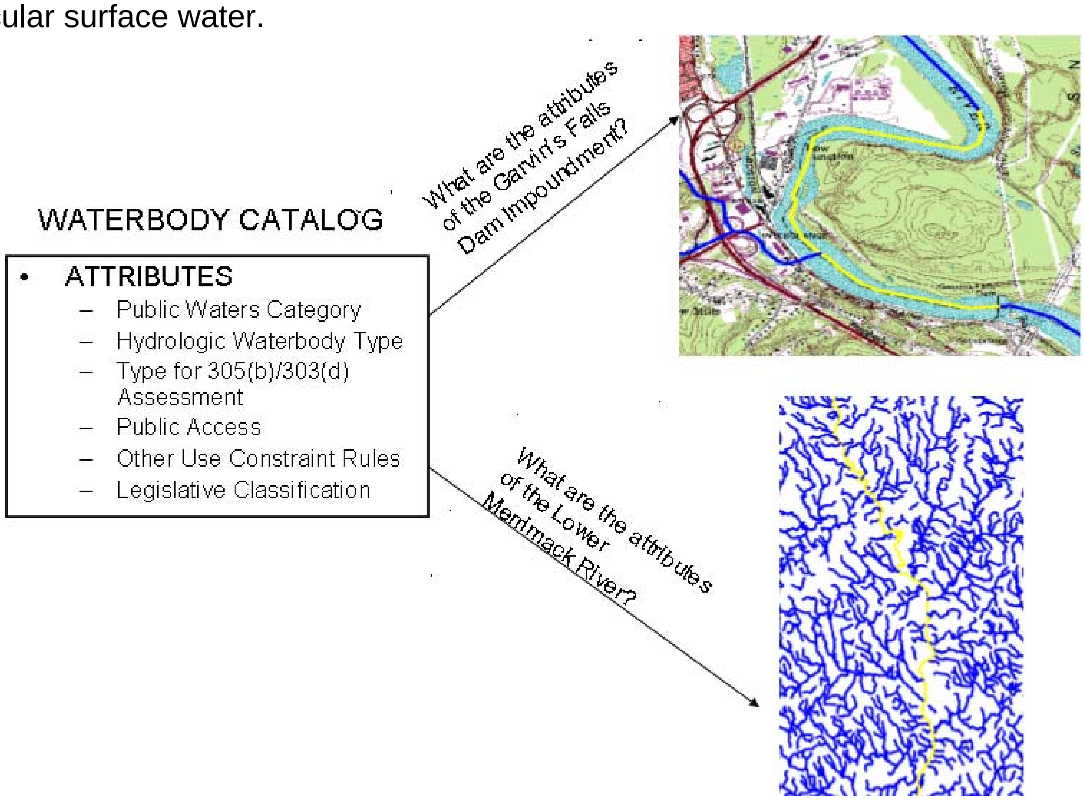

Figure 1. Attributes tied to the spatial network may be queried out at any scale and simultaneously reveal a range of additional waterbody attributes.

Some of the base attributes to be tied to the NHD network are layers like the;

Hydrologic Waterbody Type – The type based upon hydrological/physical conditions that exist during the normal or critical period of time. The draft decision tree that shall be used to determine the appropriate hydrologic waterbody type (Fig. 2) will be critical to applying the appropriate water quality standards.

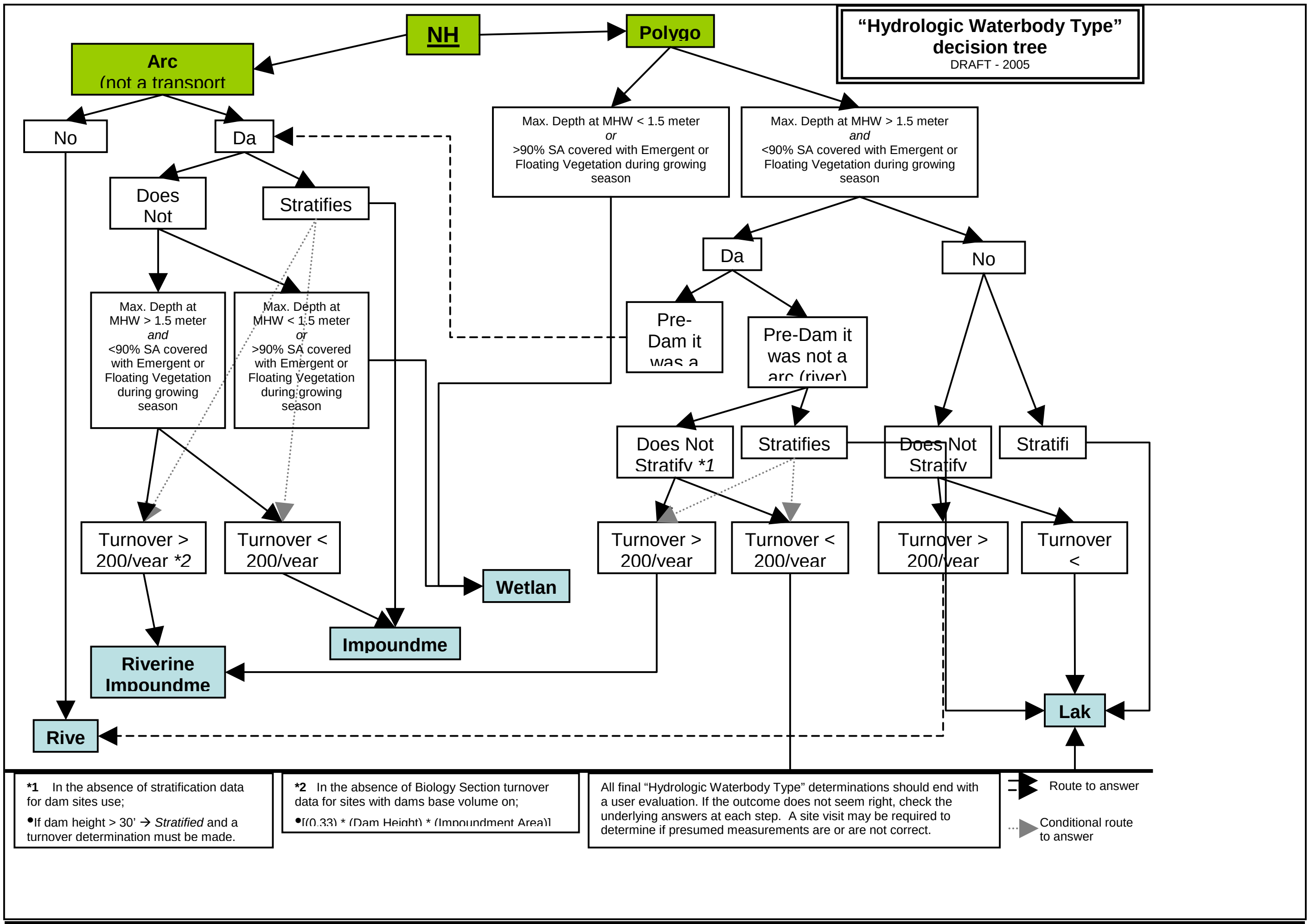

Figure 2. The draft decision tree that will be used to determine the appropriate hydrologic waterbody type.

Assessment Unit Definition – One, or a collection of, surface water(s) that may be evaluated as one unit. Assessment units are intended to be of a general homogenous hydrologic waterbody type.
Waterbody Name – A name that is used to define some geographic extent of one, or a collection of, surface waters locations. (The "Merrimack River" includes the waterbody types; river, impoundment, wetlands,…). This will include the myriad of aliases that occur due to a given water body being named by many individuals and changing its name over time (ex. Canobie Lake was Policy Pond until 1885 and the name Policy Pond came from the native word "Polis").
Public Water – Whether or not a waterbody is "public" as described by the assorted RSA's.
Public Access – Whether or not, and is so what type, of access is provided to the water.
Use Constraints – The presence of waterbody use constraints from the Department of Safeties watercraft restrictions to the Public Water Supply Rules restrictions.
Legislative Classification – Classification as A or B by the legislature and the chapter law defining tat classification.
Stream Order – Stream order by the Strahler method.
Shoreline Protection Act – Whether or not the shoreline of the waterbody is protected by the Shoreline Protection Act.
Designated River – Whether or not the waterbody falls under RSA 483 and if so the designated type.
DES Biology Program Lake types – The lake type maintained by the DES Biology Section (Natural, Artificial, Natural, Raised by dam, Breached Dam, …)

The department will become the keepers of the attribute data that makes-up the Comprehensive WB catalog layers and work with individual groups to resolve questions that arise. There will be indexing individual layers to the NHD makes for "easy" querying. A mechanism may be built to get attributes for a waterbody within the framework of the EMD.

APPENDIX 2 – PROBABILISTIC MONITORING CONCEPTUAL DESIGN

(SUBMITTED UNDER SEPARATE COVER)

APPENDIX 3 – NH WATERSHED APPROACH

DES is in the process of developing a Watershed Approach that is expected to have a significant impact on DES' prioritization of future targeter monitoring efforts. The New Hampshire Watershed Approach will be a coordinating framework for water quality management that will focus public and private sector efforts to address the highest priority issues within hydrologically defined geographic areas. It will also be a means to increase the efficiency, involvement, focus and effectiveness of watershed management efforts in New Hampshire, and in particular within the Watershed Management Bureau.

Based on GIS data and analysis, DES prepared a list of priority HUC 10 watersheds, within which organizations were eligible to apply for pilot watershed approach projects. Using a competitive process, organizations proposing work in the Lake Sunapee and Lake Waukewan watersheds were selected to pilot the watershed approach.

In the Lake Sunapee watershed, the top water quality concerns are those related to runoff from impervious areas in shoreland zones and from potential new development. Long-term monitoring has shown increases in total phosphorus and conductivity in the lake. The goal of the watershed plan is to slow the rate of increase in these pollutants as the watershed develops.

The Lake Waukewan Advisory Committee is concerned about maintaining a high quality drinking water source and in maintaining high water quality in a relatively undeveloped watershed. The Committee is interested in using biological monitoring as a tool to measure water quality impacts in the lake's tributary watersheds.

Both projects will include development of a watershed management plan that includes monitoring to measure long-term success. DES will provide staff assistance for both projects depending on the specific scopes of services. Lessons learned will be incorporated in the Watershed Management Bureau's strategic plan in order to provide the most effective water quality services to the state.

APPENDIX 4 – IMPLEMENTATION REQUIREMENTSFOR SUPPORT AND INFRASTRUCTURE

TABLE 4.1: PROJECT DESCRIPTIONS AND PRIORITIES

PROJID	CMS ELEMENT (SEE NOTES AT END)	PROJECT DESCRIPTION	MONITORING DESIGN (SEE NOTES AT END)	# SAMPLING STATIONS / YEAR	SAMPLING FREQUENCY	PARAMETERS	PROJECT START YEAR	PROJECT END YEAR (ALL DATA COLLECTED AND INPUT)	PRIORITY (SEE NOTES AT END)
401CERT	1	TO DETERMINE COMPLIANCE WITH NH SURFACE WATER QUALITY STANDARDS; WATER QUALITY DATA COLLECT PURSUANT TO CONDITIONS DESCRIBED IN THE 401 WATER QUALITY CERTIFICATE FOR THE PROJECT. DATA IS PRIMARILY COLLECTED BY 401 APPLICANTS.	1	VARIES WITH PROJECT	VARIES WITH PROJECT	VARIES WITH 401 PROJECT	2003	ON-GOING	1
ACIDOUT	1	TO DOCUMENT ACID RAIN-RELATED TRENDS IN RELATIVELY LOW ELEVATION ACCESSIBLE PONDS TO COMPLEMENT THE REMOTE POND PROJECT.	1	20	2 TIMES PER YEAR	ACID NEUTRALIZING CAPACITY, ALUMINUM, COLOR, CALCIUM, CHLORIDE, POTASSIUM, MAGNESIUM, NITRITE+NITRATE, SODIUM, PH, SULFATE, SPEC. CONDUCTIVITY	1983	ON-GOING	1
ACIDREM	1	TO DOCUMENT ACID RAIN-RELATED TRENDS IN MOSTLY HIGH ELEVATION, REMOTE PONDS.	1	23	1 PER YEAR	ACID NEUTRALIZING CAPACITY, ALUMINUM,CALCIUM, CHLORIDE, POTASSIUM, MAGNESIUM, NITRITE+NITRATE, SODIUM, PH, SULFATE, SPEC. CONDUCTIVITY	1981	ON-GOING	1

PROJID	CMS ELEMENT (SEE NOTES AT END)	PROJECT DESCRIPTION	MONITORING DESIGN (SEE NOTES AT END)	# SAMPLING STATIONS / YEAR	SAMPLING FREQUENCY	PARAMETERS	PROJECT START YEAR	PROJECT END YEAR (ALL DATA COLLECTED AND INPUT)	PRIORITY (SEE NOTES AT END)
ARMP	1	CHEMICAL, PHYSICAL AND BIOLOGICAL SAMPLING OF RIVERS AND STREAMS PRIMARILY FOR TRENDS AND USE SUPPORT. INCLUDES 26 TREND MONITORING STATIONS. MOST SAMPLING OCCURS IN SUMMER HOWEVER TREND SAMPLING FOR 7 TRIBS TO GT BAY AT HEAD OF TIDE (WINNICUT, SQUAMSCOTT, LAMPREY, OYSTER, LAMPREY, OYSTER, BELLAMY, COCHECO, AND SALMON FALLS, AND 2 TRIBS TO LITTLE HARBOR (SAGAMORE CK AND BERRYS BK) ARE TAKEN MONTHLY FROM MARCH TO DECEMBER.	1	VARIES BUT TYPICALLY ~ 100 STATIONS / YEAR	3X/ SUMMER FOR 17 TREND STATIONS, AND 10/YEAR (MONTHLY FROM MARCH TO DEC) FOR 9 TRIBS AT HEAD OF TIDE TO GT BAY AND HAMPTON HARBOR. VARIABLE FREQUENCY FOR CONFIRMATION SAMPLING	FOR 17 HISTORIC TREND STATIONS AND 9 TREND STATIONS AT HEAD OF TIDE: DO, TEMPERATURE, CONDUCTIVITY, PH, TURBIDITY, TKN, NH3, NO2+NO3, TP, BOD, E.COLI, CHLOR A..FOR CONFIRMATION SAMPLING, PARAMETERS VARY BUT TYPICALLY ARE DO, TEMPERATURE, PH, BACTERIA AND CHLOR A.	1989	ON-GOING	1
BEACH	1	MONITOR AND SAMPLE FRESHWATER AND MARINE PUBLIC BEACHES ON A ROUTINE BASIS THROUGHOUT THE SWIM SEASON. ISSUE AND POST ADVISORIES FOR BACTERIA AND CYANOBACTERIA	1	~ 160 BEACHES WITH ABOUT 3 STATIONS PER BEACH (480 STATIONS TOTAL)	FRESHWATER BEACHES ARE SAMPLED ONCE PER MONTH FROM MID-JUNE THROUGH LABOR DAY. TIER I MARINE BEACHES ARE SAMPLED WEEKLY AND TIER II MARINE BEACHES ARE SAMPLED BI-WEEKLY FROM JUNE 1ST THROUGH LABOR DAY.	E. COLI FOR FRESHWATER BEACHES AND ENTEROCOCCI FOR MARINE BEACHES	1989	ON-GOING	1
CLNLKPER	1	DIAGNOSTIC FEASIBILITY STUDY ON PERKINS POND WITH FOCUS ON CONTROL OF NUTRIENTS (IE, PHOSPHORUS)	1	5	3-4 STORMS WITH 5 ROUNDS PER STORM	TURBIDITY, SPECIFIC CONDUCTIVITY, TOTAL AND ORTHO PHOSPHORUS	2004	2006	1

PROJID	CMS ELEMENT (SEE NOTES AT END)	PROJECT DESCRIPTION	MONITORING DESIGN (SEE NOTES AT END)	# SAMPLING STATIONS / YEAR	SAMPLING FREQUENCY	PARAMETERS	PROJECT START YEAR	PROJECT END YEAR (ALL DATA COLLECTED AND INPUT)	PRIORITY (SEE NOTES AT END)
COASTINV	1	COASTAL INVESTIGATIONS PRIMARILY RELATED TO IDENTIFICATION OF DRY WEATHER ILLICIT DISCHARGES	1	150	2	BACTERIA (MOSTLY E.COLI, SOME FECAL AND TOTAL COLIFORM), WEATHER, WATER TEMPERATURE	2001	ON-GOING	1
COASTRES	1	COASTAL RESTORATION SAMPLING ALONG COAST (MAINLY BACTERIA) TO DETERMINE IMPAIRMENTS, CAUSES AND SOURCES (INCLUDING MST AND IDDE INVESTIGATIONS) AND IN RESPONSE TO COMPLAINTS.	1	75	3	BACTERIA (E.COLI, ENTEROCOCCI, TOTAL FECAL COLIFORM), FLOW, OBSERVED WILDLIFE, TIDE HEIGHT	2001	ON-GOING	1
COMPLAIN	1	WATER QUALITY SAMPLING ASSOCIATED WITH COMPLAINT INVESTIGATIONS	1	~ 150	3 TIMES PER YEAR ON AVERAGE	VARIES. USUALLY PRIMARILY BACTERIA, TEMPERATURE, SPECIFIC CONDUCTANCE, AND TURBIDITY. OCCASSIONALLY NUTRIENTS AND METALS	1990	ON-GOING	1
CSI	1	NPDES COMPLIANCE SAMPLING PROGRAM (NPDESCSP): CHEMICAL SAMPLING OF THE EFFLUENTS FROM FACILITIES WHICH DISCHARGE POLLUTANTS TO SURFACE WATERS AND WHICH REQUIRE A STATE DISCHARGE PERMIT AND/OR A FEDERAL NPDES PERMIT.	1	~ 100	~ 1 TIME PER YEAR	TYPICALLY BOD, TSS, CHLORINE, E. COLI	1985	ON-GOING	1
E_ARMP_BIO	1	BIOMONITORING OF WADABLE RIVERS FOR USE SUPPORT, COMPLIANCE, WATER QUALITY STANDARD DEVELOPMENT AND TRENDS.	1	25 -30 (~ 15 FOR DETERMINING USE ATTAINMENT, 6-10 FOR COMPLIANCE/ENFORCEMENT, 3 (FIXED) FOR TRENDS AND ~ 5 STATIONS FOR WATER QUALITY STANDARDS DEVELOPMENT	UP TO 3 TIMES DURING SUMMER	FISH, MACROINVERTEBRATES, HABITAT, D.O, TEMPERATURE, PH, CONDUCTIVITY, ACID NEUTRALIZING CAPACITY, STREAM FLOW, VARIOUS MORPHOLOGIC CHARACTERS	2000	ON-GOING	1

PROJID	CMS ELEMENT (SEE NOTES AT END)	PROJECT DESCRIPTION	MONITORING DESIGN (SEE NOTES AT END)	# SAMPLING STATIONS / YEAR	SAMPLING FREQUENCY	PARAMETERS	PROJECT START YEAR	PROJECT END YEAR (ALL DATA COLLECTED AND INPUT)	PRIORITY (SEE NOTES AT END)
E_BCHTMDL	1	MONITORING TO SUPPORT BACTERIA TMDLS ON 3 FRESHWATER BEACHES	1	~ 12	12 DRY WEATHER AND 4 WET WEATHER (ALL SAMPLING WAS DONE IN 2005)	E. COLI AND MICROBIAL SOURCE TRACKING (DNA)	2005	2006	1
E_CLNLK	1	TMDL/DIAGNOSTIC FEASIBILITY STUDIES ON 1-2 LAKES PER YEAR. CURRENT FOCUS IS ON CONTROL OF NUTRIENTS (IE, PHOSPHORUS)	1	10-20 STATIONS (TYPICALLY 1 IN-LAKE, 5-10 TRIBUTARIES, AND 5-10 GROUNDWATER SEEPAGE STATIONS	IN -LAKE ~ 3 TIMES IN SUMMER; TRIBUTARIES AND SEEPAGE STATIONS ~ 2-4 TIMES /MONTH FOR 9 MONTHS.	TURBIDITY, SPECIFIC CONDUCTIVITY, TOTAL AND ORTHO PHOSPHORUS	1995	ON-GOING	1
E_COCHBIO	1	COCHECO RIVER VOLUNTEER BIOMONITORING PILOT PROJECT USING KICK NETS.	1	10	3	BENTHIC MACROINVERTEBRATES	2005	2006	1
E_EXOTICS	1	EDUCATION/OUTREACH / MONITORING PROGRAM TO CONTROL EXOTIC WEEDS. INCLUDES THE VOLUNTEER WEED WATCHER PROGRAM. PROVIDES MATCHING GRANTS TO TOWNS TO CONTROL EXOTICS AND MONITOR LAKES FOR EXOTICS (PRIMARILY PLANT SAMPLES) MAP VEGETATION, HERBICIDE TREATMENT AND SCUBA HAND PULLING.	1	~ 30 LAKES/YR ON AVERAGE	1.5 TIMES PER LAKE ON AVERAGE	EXOTIC PLANTS, ~ 25 SAMPLES /YEAR OF 2, 4 D OR DIQUAT (2 HERBICIDES)	1995	ON-GOING	1
E_EXRBIO	1	EXETER RIVER BIOMONITORING PROJECT IN PARTNERSHIP WITH USGS AND VOLUNTEERS	1	10	5	BIOLOGICAL DATA	2004	2005	1
E_FISHHG	1	ANNUAL SAMPLING OF FISH TISSUE FOR MERCURY. SAMPLES ARE COLLECTED BY VOLUNTEERS, NH FISH AND GAME AND DES.	1	10-20 LAKES/YEAR WITH ~ 200 FISH /YEAR	1 /YR	MERCURY IN FISH TISSUE	1995	ON-GOING	1

PROJID	CMS ELEMENT (SEE NOTES AT END)	PROJECT DESCRIPTION	MONITORING DESIGN (SEE NOTES AT END)	# SAMPLING STATIONS / YEAR	SAMPLING FREQUENCY	PARAMETERS	PROJECT START YEAR	PROJECT END YEAR (ALL DATA COLLECTED AND INPUT)	PRIORITY (SEE NOTES AT END)
E_SHELLEMRG	1	MONITOR SHELLFISH WATER AND TISSUES FOLLOWING SIGNIFICANT RELEASES OF IMPROPERLY TREATED SEWAGE AND OTHER CONTAMINANTS.	1	UP TO ~75	AS NEEDED	FECAL COLIFORM, TEMP, SALINITY, PH, SHELLFISH TISSUE	2001	ON-GOING	1
E_SHELLPOST	1	MONITOR SHELLFISH WATER AND TISSUES FOLLOWING CONDITIONAL AREA CLOSURES (FOR RAINFALL, WWTF PERFORMANCE, SEASONAL ISSUES)	1	~50	JAN - DEC	FECAL COLIFORM, TEMP, SALINITY, PH	2001	ON-GOING	1
E_SHELLSTU	1	CONDUCT WATER QUALITY STUDIES (EG, TIDAL EFFECTS, RAINFALL EFFECTS, ETC.) AS NEEDED TO SATISFY NSSP SANITARY SURVEY REQUIREMENTS	1	UP TO ~75	JAN - DEC	FECAL COLIFORM, TEMP, SALINITY, PH	2001	ON-GOING	1
E_SHELLTIS	1	MONITOR SHELLFISH TISSUE W/WATERS UNDER BASELINE DRY AND DURING/AFTER RAINFALL EVENTS	1	BETWEEN 6 AND 10	JAN - DEC AS WEATHER CONDITIONS ALLOW	FECAL COLIFORM, TEMP, SALINITY, PH, SHELLFISH TISSUE	2001	ON-GOING	1
E_SLTMSH	1	SAMPLE POTENTIAL/ACTUAL POLLUTION SOURCES UNDER DRY WEATHER CONDITIONS	1	~ 10 STATIONS	~1 /SITE EXCEPT SALINITY WHICH IS ONCE EVERY 3 WEEKS	Biological (fish and vegetation), salinity, groundwater, dissolved oxygen, conductivity	2005	ON-GOING	1
EELGRASS	1	MONITORING SHELLFISH TISSUE FOR PSP TOXIN, ISSUE CLOSURS AS NEEDED	2	THE ENTIRE ESTUARIE IS MAPPED EACH YEAR	ANNUALLY	DISTRIBUTION OF EELGRASS MAPPED USING LOW ALTITUDE AERIAL IMAGERY AND GROUNDTRUTHING BY BOAT	1986	ON-GOING	1
FGFFISH	1	MONITOR SHELLFISH GROWING WATERS UNDER NSSP SYSTEMATIC RANDOM SAMPLING PROTOCOL	2	11 STATIONS IN THE GREAT BAY AND PISCATAQUA RIVER, 4 STATIONS IN HAMPTON HARBOR	MONTHLY FROM JUNE TO NOVEMBER	ABUNDANCE OF JUVENILE FINFISH AND SHELLFISH PREDATORS (GREEN CRAB) BY BEACH SEINE HAULS.	1996	ON-GOING	1

PROJID	CMS ELEMENT (SEE NOTES AT END)	PROJECT DESCRIPTION	MONITORING DESIGN (SEE NOTES AT END)	# SAMPLING STATIONS / YEAR	SAMPLING FREQUENCY	PARAMETERS	PROJECT START YEAR	PROJECT END YEAR (ALL DATA COLLECTED AND INPUT)	PRIORITY (SEE NOTES AT END)
FGHERRIN	1	INITIAL SAMPLING AND IDENTIFICATION OF POTENTIAL/ACTUAL POLLUTION SOURCES	1	FISH LADDERS IN THE COCHECO, EXETER, OYSTER, LAMPREY, TAYLOR AND WINNICUT RIVERS	DAILY DURING SPRING RUNS	HERRING COUNTS, SEX, SIZE/AGE DISTRIBUTION OF RETURNING ADULT FISH	1972	ON-GOING	1
FGLOBJUV	1	SAMPLE POTENTIAL/ACTUAL POLLUTION SOURCES UNDER WET WEATHER CONDITIONS	2	ADAMS PT, WOODMAN PT, NANNIE ISLAND, PISCATAQUA AND SQUAMSCOTT RIVERS	MONTHLY FROM APRIL TO JANUARY	JUVENILE LOBSTER ABUNDANCE MONITORED BY SCUBA DIVERS.	1992	ON-GOING	1
FGLOBSEA	1	TO MONITOR THE ABUNDANCE AND SIZE OF LOBSTERS IN NH COASTAL WATERS	2	THROUGHOUT THE PISCATAQUA RIVER AND NH NEAR-SHORE WATERS	MONTHLY FROM JUNE TO OCTOBER	LOBSTER ABUNDANCE AND SIZE CLASSES	1992	ON-GOING	1
FGOYSHAR	1	TO DETERMINE NUMBER OF OYSTERS HARVESTED DURING A SEASON	2	THERE ARE NO FIXED STATIONS FOR THIS PROGRAM	EVERY 3 YEARS	RECREATIONAL HARVEST OF OYSTERS FROM ALL BEDS.	1996	ON-GOING	1
FGOYSMSX	1	TO DETERMINE THE PREVALENCE OF INFECTION AMONG OYSTERS IN GREAT BAY REEFS	2	4 SITES TESTED BIENNIALLY (ADAMS POINT BED, WOODMAN POINT BED, OYSTER RIVER BED). ONE SITE TESTED ANNUALLY (NANNIE ISLAND BED). OTHER SITES (PISCATAQUA RIVER BED AND SQUAMSCOTT RIVER BED) TESTED LESS FREQUENTLY.	ANNUALLY	PREVALENCE OF MSX AND DERMO IN OYSTERS	1991	ON-GOING	1

PROJID	CMS ELEMENT (SEE NOTES AT END)	PROJECT DESCRIPTION	MONITORING DESIGN (SEE NOTES AT END)	# SAMPLING STATIONS / YEAR	SAMPLING FREQUENCY	PARAMETERS	PROJECT START YEAR	PROJECT END YEAR (ALL DATA COLLECTED AND INPUT)	PRIORITY (SEE NOTES AT END)
FGOYSRES	1	TO ASSESS THE ABUNDANCE AND COMMUNITY STRUCTURE OF OYSTERS AT BEDS IN THE GREAT BAY ESTUARY	1	6 SITES: ADAMS POINT, NANNIE ISLAND, WOODMAN POINT, OYSTER RIVER BED, PISCATAQUA RIVER BED, AND SQUAMSCOTT RIVER BED.	ANNUALLY IN OCTOBER/NOVEMBER FOR DENSITY; EVERY 5 YEARS FOR BED DIMENSIONS	ADULT, JUVENILE, AND SPAT OYSTER DENSITY, AND DIMENSIONS OF OYSTER BEDS	1991	ON-GOING	1
FGSHAD	1	TO RESTORE AMERICAN SHAD TO THE COASTAL RIVER SYSTEMS OF NEW HAMPSHIRE TO A LEVEL THAT WILL PRODUCE SELF-SUSTAINING SPAWNING RUNS AND TO MONITOR THE EFFECTS OF RESTORATION EFFORTS.	1	FISH LADDERS AT COCHECO, EXETER AND LAMPREY RIVERS	DAILY FROM APRIL TO JUNE	SHAD COUNT,SEX, SIZE/AGE DISTRIBUTION OF RETURNING ADULT FISH	1983	ON-GOING	1
FGSMELT	1	TO ANNUALLY MONITOR THE RESOURCE OF RAINBOW SMELT (OSMERUS MORDAX) AND ITS FISHERY IN THE GREAT BAY ESTUARY SYSTEM.	1	BELLAMY, OYSTER, LAMPREY, WINNICUT AND SQUAMSCOTT RIVERS	ANNUALLY DURING THE WINTER MONTHS (EGGS IN MARCH)	RAINBOW SMELT ABUNDANCE OF ADULTS AND EGGS	1978	ON-GOING	1
FGWFOWL	1	TO MONITOR TYPE AND QUANTITY OF WATERFOWL WINTERING IN GREAT BAY	2	ONE DAY AERIAL OVERFLIGHT	ANNUALLY IN JANUARY	ABUNDANCE AND TYPE OF WATERFOWL PRESENT IN THE ESTUARY DURING WINTER MONTHS	1955	ON-GOING	1
GBCWHAB	1	TO MONITOR THE OCCURRENCE OF HARMFUL PHYTOPLANKTON SPECIES IN NH COASTAL WATERS.	1	7 STATIONS ALONG THE NH COAST	WEEKLY FROM APRIL TO NOVEMBER	PHYTOPLANKTON SPECIES FROM A 3 MINUTE TOW, TEMPERATURE, SALINITY, DO, AND SECCHI DEPTH.	1999	ON-GOING	1
GBCWTWQ	1	TO MONITOR THE FECAL COLIFORM CONTENT OF WATER SAMPLED AT A WIDE-ARRAY OF STATIONS AND TO REPORT UNUSUALLY HIGH OR LOW COUNTS TO APPROPRIATE INDIVIDUALS AND AGENCIES.	1	21 SITES	TWICE MONTHLY AT HIGH AND LOW TIDES FROM APRIL TO NOVEMBER	FECAL COLIFORMS, TEMPERATURE, SALINITY, PH, DISSOLVED OXYGEN, SECCHI DEPTH	1990	ON-GOING	1

PROJID	CMS ELEMENT (SEE NOTES AT END)	PROJECT DESCRIPTION	MONITORING DESIGN (SEE NOTES AT END)	# SAMPLING STATIONS / YEAR	SAMPLING FREQUENCY	PARAMETERS	PROJECT START YEAR	PROJECT END YEAR (ALL DATA COLLECTED AND INPUT)	PRIORITY (SEE NOTES AT END)
GULFWTCH	1	TO MONITOR MARINE SENTINEL SPECIES' EXPOSURE TO ORGANIC AND INORGANIC CONTAMINANTS.	2	THE THREE ANNUAL TREND SITES ARE LOCATED IN CLARKS COVE (PORTSMOUTH HARBOR), DOVER POINT, AND HAMPTON/SEABROOK HARBOR. ONE OR TWO OTHER STATIONS ARE SAMPLED EACH YEAR.	THREE ANNUAL TREND SITES AND A ROTATING SCHEDULE FOR OTHER SITES.	HEAVY METALS AND TOXIC ORGANIC CONTAMINANTS IN BLUE MUSSEL TISSUE.	1991	ON-GOING	1
JELSND	1	TO PROVIDE A NEARLY CONTINUOUS RECORD OF PHYSICO-CHEMICAL WATER QUALITY IN GREAT BAY AND ITS TRIBUTARIES.	1	2 STATIONS	MEASUREMENTS MADE EVERY 30 MINUTES BY IN-SITU DATALOGGERS FROM APRIL TO DECEMBER.	SALINITY, WATER LEVEL, CONDUCTIVITY, TEMPERATURE, PH, TURBIDITY, DO	1995	ON-GOING	1
JELTWQ	1	TO MONITOR TRENDS IN PHYSICOCHEMICAL, NUTRIENT, AND EUTROPHICATION PARAMETERS IN THE GREAT BAY AND PORTSMOUTH HARBOR.	1	3 STATIONS	MONTHLY FROM APRIL TO DECEMBER	NUTRIENTS, CHLOROPHYLL-A, AND TSS	1988	ON-GOING	1
LKTROPH	1	TO DETERMINE LAKE TROPHIC CLASS AND MONITOR PHYSICAL, CHEMICAL AND BIOLOGICAL WQ PARAMETERS	1	40	2 TIMES PER YEAR (ONCE IN SUMMER AND ONCE IN WINTER)	ACID NEUTRALIZING CAPACITY, COLOR, CHLOR A, CALCIUM, CHLORIDE, POTASSIUM, MAGNESIUM, NITRITE+NITRATE, TKN, TOTAL PHOSPHORUS, SODIUM, PH, SULFATE, SPEC. CONDUCTIVITY, DISSOLVED OXYGEN (MG/L AND % SAT), SECCHI, TEMPERATURE, E. COLI, TROPHIC STATUS, VASCULAR PLANT ABUNDANCE, WEATHER.	1975	ON-GOING	1

PROJID	CMS ELEMENT (SEE NOTES AT END)	PROJECT DESCRIPTION	MONITORING DESIGN (SEE NOTES AT END)	# SAMPLING STATIONS / YEAR	SAMPLING FREQUENCY	PARAMETERS	PROJECT START YEAR	PROJECT END YEAR (ALL DATA COLLECTED AND INPUT)	PRIORITY (SEE NOTES AT END)
MERRINV	1	SAMPLES COLLECTED DURING INVESTIGATIONS OF DRY WEATHER OUTFALLS IN THE COASTAL AND MERRIMACK WATERSHEDS INCLUDING THOSE SAMPLES COLLECTED IN SUPPORT OF RESTORATION PROJECTS FUNDED THROUGH THE SECTION 319 PROGRAM.SAMPLES ARE COLLECTED FROM DISCHARGING PIPES, CULVERTS, SWALES AND SEEPS DURING DRY WEATHER CONDITIONS	1	~ 50 STATIONS / YEAR	2 -3 TIMES A YEAR ON AVERAGE	E. COLI	2002	ON-GOING	1
MRFSS	1	TO OBTAIN ESTIMATES OF TOTAL CATCH, TOTAL EFFORT, CATCH PER UNIT EFFORT, PERCENT SPECIES COMPOSITION OF THE CATCH, AND LENGTH FREQUENCY DATA FOR HARVESTED FISH.	2	Variable	Peak times during fishing season	Recreational harvest of Striped Bass, Cod, Bluefish, Pollock, Mackerel, and White Flounder.	1990	ON-GOING	1
N_NUTPERI	1	SAMPLING OF WADABLE RIVERS FOR PERIPHYTON, NUTRIENTS AND DO TO ASSIST WITH NUTRIENT CRITERIA DEVELOPMENT	1	3	12	DISSOLVED OXYGEN, PH, TP, ORTHO P, TKN, NO2 AND NO3, PERIPHYTON CHLOR A AND MASS.	2006	2008	1
N_PBM1	1	SAMPLING OF RANDOM STATIONS ON RIVERS (EXCLUDING 2ND THROUGH 4 ORDER STREAMS) AND LAKES FOR AQUATIC LIFE, PRIMARY AND SECONDARY CONTACT RECREATION PROBABILISTIC ASSESSMENTS BY 2016.	3	15-25 (5-8 ON 1ST ORDER STREAMS, 5-8 ON GREATER THAN 4TH ORDER STREAMS, 5-8 ON LAKES AND IMPOUNDMENTS)	1 PER STATION PER YEAR	PH AND DISSOLVED OXYGEN AND E. COLI	2009	ON-GOING	2

PROJID	CMS ELEMENT (SEE NOTES AT END)	PROJECT DESCRIPTION	MONITORING DESIGN (SEE NOTES AT END)	# SAMPLING STATIONS / YEAR	SAMPLING FREQUENCY	PARAMETERS	PROJECT START YEAR	PROJECT END YEAR (ALL DATA COLLECTED AND INPUT)	PRIORITY (SEE NOTES AT END)
N_PBM2	1	SAMPLING OF RANDOM STATIONS ON WADABLE RIVERS (2ND THROUGH 4 ORDER STREAMS) FOR AQUATIC LIFE AND PRIMARY AND SECONDARY CONTACT RECREATION PROBABILISTIC ASSESSMENTS AND FRESHWATER BEACHES FOR PRIMARY AND SECONDARY CONTACT RECREATION BY 2016.	3	5 - 8 STATIONS ON WADABLE STREAMS AND 5 TO 8 STATIONS ON FRESHWATER BEACHES.	1	FISH, MACROINVERTEBRATES, HABITAT, D.O, TEMPERATURE, PH, CONDUCTIVITY, ACID NEUTRALIZING CAPACITY, STREAM FLOW, VARIOUS MORPHOLOGIC CHARACTERS AND E. COLI	2009	ON-GOING	2
N_TAROC1	1	SAMPLING OF MAJOR OCEAN ASSESSMENT UNITS TO ALLOW DETERMINISTIC ASSESSMENTS OF AQUATIC LIFE AND PRIMARY AND SECONDARY CONTACT RECREATION USES BY 2010.	1	5 STATIONS BY 2009	3 DAYS WITHIN A 60 DAY PERIOD. REPEAT EVERY 5 YEARS.	1 SAMPLE / STATION ON 2 SITE VISITS FOR PH ; 2 SAMPLES / STATION ON 2 SITE VISITS FOR DO (HIGH AND LOW TIDE); 1 SAMPLE / STATION AT 3 STATIONS ON 3 SITE VISITS WITHIN 60 DAYS FOR ENTEROCOCCI.	2009	ON-GOING	2
N_TMDLCHL	1	MONITORING ASSOCIATED WITH CHLORIDE TMDL (MAJORITY OF FUNDING FROM NHDOT)	1	~ 100	2 TO 3 TIMES	SPECIFIC CONDUCTANCE, CHLORIDES, FLOW	2006	2011	1
N_TMDLES1	1	MONITORING ASSOCIATED WITH DISSOLVED OXYGEN / NUTRIENT TMDLS IN ESTUARIES	1	~25	2 TO 3 TIMES	DISSOLVED OXGYEN, TEMPERATURE, SALINITY, SPECIFIC CONDUCTANCE, PH, TOTAL SUSPENDED SOLIDS, NUTRIENTS, BOD, CHLOR A	2008	ON-GOING	1
N_TMDLR1	1	MONITORING ASSOCIATED WITH TMDLS ON RIVERS (INITIAL FOCUS IS ON DISSOLVED OXYGEN AND NUTRIENT IMPAIRMENTS)	1	~ 25	2 TO 3 TIMES	DISSOLVED OXGYEN, TEMPERATURE, SPECIFIC CONDUCTANCE, PH, TOTAL SUSPENDED SOLIDS, NUTRIENTS, BOD, CHLOR A, FLOW	2001	ON-GOING	1
N_WQSDEV	1	SAMPLING TO SUPPORT DEVELOPMENT OF WATER QUALITY STANDARDS	1	VARIABLE - ASSUME 20 STATIONS	2 - 3 TIMES	PARAMETERS VARY DEPENDING ON WATER QUALITY STANDARD OF CONCERN	2009	ON-GOING	2

PROJID	CMS ELEMENT (SEE NOTES AT END)	PROJECT DESCRIPTION	MONITORING DESIGN (SEE NOTES AT END)	# SAMPLING STATIONS / YEAR	SAMPLING FREQUENCY	PARAMETERS	PROJECT START YEAR	PROJECT END YEAR (ALL DATA COLLECTED AND INPUT)	PRIORITY (SEE NOTES AT END)
NADP	1	TO MONITOR TRENDS IN ATMOSPHERIC DEPOSITION OF MERCURY AND NITROGEN	1				1978	ON-GOING	1
NCAPBM	1	TO ASSESS THE HEALTH AND CONDITION OF NH ESTUARIES USING A PROBABILITY BASED SAMPLING DESIGN.	3	50 SITES IN A PROBABILISTIC SAMPLING DESIGN.	EACH STATION IS ASSESSED ONCE EVERY 2 YEARS.	SEDIMENT PARAMETERS: METALS, PAH'S, PCB'S, PESTICIDES, SEDIMENT TOXICITY, TOTAL ORGANIC CARBON, GRAIN SIZE, AND BENTHIC COMMUNITY COMPOSITION AND ABUNDANCE. WATER QUALITY PARAMETERS: PHYSICOCHEMICAL, NUTRIENTS, CHLOROPHYLL-A, TSS.	2000	ON-GOING	1
NCASED	1	TO STUDY SPATIAL AND TEMPORAL HETEROGENEITY IN TOXIC CONTAMINANT CONCENTRATIONS IN SEDIMENTS IN THE GREAT BAY ESTUARY.	1				2002	ON-GOING	1
NCATWQ	1	TO ASSESS TRENDS IN THE HEALTH AND CONDITION OF NH ESTUARIES BY MONITORING SEASONAL CHANGES IN WATER AND SEDIMENT QUALITY.	1	9 STATIONS TOTAL	MONTHLY FROM APRIL TO DECEMBER	BACTERIA CONCENTRATIONS (FECAL COLIFORMS, ENTEROCOCCI, E. COLI AS WELL AS C. PERFRINGENS AT SOME SITES). NUTRIENTS (NITROGEN, PHOSPHORUS), SILICA, SUSPENDED SOLIDS, DISSOLVED OXYGEN, CHLOROPHYLL-A MEASURED AT THREE OF THE SITES.	2002	ON-GOING	1
NERRSND	1	TO PROVIDE A NEARLY CONTINUOUS RECORD OF PHYSICO-CHEMICAL WATER QUALITY IN GREAT BAY AND ITS TRIBUTARIES.	2	4 SITES; GREAT BAY, SQUAMSCOTT RIVER, LAMPREY RIVER, AND OYSTER RIVER	30 MINUTE INTERVALS DURING NON-WINTER MONTHS	SALINITY, WATER LEVEL, CONDUCTIVITY, TEMPERATURE, PH, TURBIDITY, DO	1995	ON-GOING	1

PROJID	CMS ELEMENT (SEE NOTES AT END)	PROJECT DESCRIPTION	MONITORING DESIGN (SEE NOTES AT END)	# SAMPLING STATIONS / YEAR	SAMPLING FREQUENCY	PARAMETERS	PROJECT START YEAR	PROJECT END YEAR (ALL DATA COLLECTED AND INPUT)	PRIORITY (SEE NOTES AT END)
NERRTWQ	1	TO MONITOR TRENDS IN PHYSICOCHEMICAL, NUTRIENT, AND EUTROPHICATION PARAMETERS IN THE GREAT BAY AND ITS TRIBUTARIES.	1	4 SITES COINCIDENT WITH THE FOUR DATASONDES (SQUAMSCOTT R., LAMPREY R., OYSTER R., AND MIDDLE OF GREAT BAY).	MONTHLY (SAMPLES COLLECTED AT HIGH AND LOW TIDES ON SAME DAY) EXCEPT FOR THE OYSTER RIVER SITE WHERE 10 SAMPLES/DAY ARE COLLECTED EVERY MONTH TO EVALUATE TIDAL EFFECTS ON WATER QUALITY.	SALINITY, TEMPERATURE, PH, DO, TSS, POM, CHLOROPHYLL-A, PHAEOPIGMENTS, AMMONIA, SUM OF NITRATE AND NITRITE, ORTHOPHOSPHATE, DISSOLVED ORGANIC NITROGEN, PARTICULATE ORGANIC NITROGEN, AND LIGHT ATTENUATION	1988	ON-GOING	1
NERRWWS	1	TO MONITOR TYPE AND QUANTITY OF WATERFOWL WINTERING IN THE GREAT BAY	2	3 OR 4 TEAMS COVER THE ENTIRE BAY	EVERY 2 WEEKS FROM JANUARY TO MARCH	ABUNDANCE AND TYPE OF WATERFOWL PRESENT DURING WINTER MONTHS	2002	ON-GOING	1
NHEPOYS	1	TO MAP THE DIMENSIONS OF THE MAJOR OYSTER BEDS IN GREAT BAY. THE BED DIMENSIONS ARE USED IN THE CALCULATION OF OYSTER STANDING STOCK.	1				2001	ON-GOING	1
NHEPTWQ	1	TO MONITOR A SUITE OF MICROBIAL PATHOGEN INDICATORS, NUTRIENTS, AND EUTROPHICATION PARAMETERS IN AMBIENT TIDAL WATERS.	1				1999	ON-GOING	1
NMFS	1	TO COMPILE DATA ON ANNUAL COMMERCIAL FISH CATCH TO CREATE ESTIMATES OF POPULATION	1	COMMERCIAL FISH PIERS	STATISTICS COMPILED YEARLY	COMMERCIAL CATCH (LBS) FOR 33 FISH SPECIES, 11 INVERTEBRATE SPECIES	1950	ON-GOING	1

PROJID	CMS ELEMENT (SEE NOTES AT END)	PROJECT DESCRIPTION	MONITORING DESIGN (SEE NOTES AT END)	# SAMPLING STATIONS / YEAR	SAMPLING FREQUENCY	PARAMETERS	PROJECT START YEAR	PROJECT END YEAR (ALL DATA COLLECTED AND INPUT)	PRIORITY (SEE NOTES AT END)
NOAANST	1	TO MONITOR CHEMICAL CONTAMINANTS IN MUSSEL TISSUE TO DETERMINE WHICH COASTAL REGIONS ARE AT GREATEST RISK IN TERMS OF ENVIRONMENTAL QUALITY	2	1 SITE AT DOVER POINT IN NH	BIENNIALLY	HEAVY METALS AND TOXIC ORGANICS IN BLUE MUSSEL TISSUE	1986	ON-GOING	1
SHELLDRY	1	SAMPLE POTENTIAL/ACTUAL POLLUTION SOURCES UNDER DRY WEATHER CONDITIONS	1	25-50 SITES	3-5 TIME PER YEAR, SPRING THRU FALL, SOMETIMES MORE AS NEEDED.	FECAL COLIFORM	1997	ON-GOING	1
SHELLPSP	1	MONITORING SHELLFISH TISSUE FOR PSP TOXIN, ISSUE CLOSURES AS NEEDED	1	2 PRIMARY STATIONS, OTHERS AS NEEDED	WEEKLY, APRIL - OCT	PSP TOXIN	2001	ON-GOING	1
SHELLRMP	1	MONITOR SHELLFISH GROWING WATERS UNDER NSSP SYSTEMATIC RANDOM SAMPLING PROTOCOL	1	~75	1-2 TIMES PER MONTH, 9-12 MONTHS PER YEAR	FECAL COLIFORM, TEMP, SALINITY, PH	1988	ON-GOING	1
SHELLSUR	1	INITIAL SAMPLING AND IDENTIFICATION OF POTENTIAL/ACTUAL POLLUTION SOURCES	1	50	COMPLETE AS OF 2005; TO BE RESUMED IN 2011	FECAL COLIFORM	1997	ON-GOING	1
SHELLWET	1	SAMPLE POTENTIAL/ACTUAL POLLUTION SOURCES UNDER WET WEATHER CONDITIONS	1	25-50 STATIONS	3-5 TIME PER YEAR, SPRING THRU FALL, SOMETIMES MORE AS NEEDED.	FECALCOLIFORM	1997	ON-GOING	1

PROJID	CMS ELEMENT (SEE NOTES AT END)	PROJECT DESCRIPTION	MONITORING DESIGN (SEE NOTES AT END)	# SAMPLING STATIONS / YEAR	SAMPLING FREQUENCY	PARAMETERS	PROJECT START YEAR	PROJECT END YEAR (ALL DATA COLLECTED AND INPUT)	PRIORITY (SEE NOTES AT END)
SSBETHOS	1	THE OBJECTIVE OF THIS PROGRAM IS TO WHETHER DIFFERENCES THAT EXIST AMONG MARINE MACROBENTHIC COMMUNITIES AT NEARFIELD AND FARFIELD SITES IN THE HAMPTON-SEABROOK AREA CAN BE ATTRIBUTED TO THE OPERATION OF SEABROOK STATION.	1	6 SITES OUTSIDE THE ESTUARIES.	3 TIMES PER YEAR.	PARAMETERS -- ATTACHED EPIFAUNA AND EPIFLORA.	1978	ON-GOING	1
SSCLAM	1	TO DETERMINE THE SPATIAL AND TEMPORAL PATTERNS OF ABUNDANCE OF VARIOUS LIFE STAGES OF SOFT-SHELL CLAMS IN THE VICINITY OF HAMPTON HARBOR, NH, AND DETERMINE WHETHER THESE PATTERNS HAVE BEEN AFFECTED BY OPERATION OF SEABROOK STATION.	1	3 FOR LARVAE, VARIABLE FOR DENSITY, 4 FOR CRAB ABUNDANCE	WEEKLY FOR LARVAE, YEARLY FOR DENSITY, TWICE PER MONTH FOR CRABS, WEEKLY FOR HARVEST PRESSURE, AND APPROXIMATELY EVERY 5 YEARS FOR FLAT DIMENSIONS.	PARAMETERS -- BIVALVE LARVAE, CLAM DENSITY, GREEN CRAB CPUE, HARVEST PRESSURE, AND SARCOMATOUS NEOPLASIA IN CLAMS.	1970	ON-GOING	1
SSCRUST	1	THE OBJECTIVE OF THE EPIBENTHIC CRUSTACEA MONITORING PROGRAM IS TO DETERMINE IF SEASONAL, SPATIAL, AND ANNUAL TRENDS IN LARVAL DENSITY AND CATCH PER UNIT EFFORT OF THE JUVENILE AND ADULT STAGES OF THE AMERICAN LOBSTER, JONAH CRAB, AND ROCK CRAB ARE RELATE	1	3 SITES FOR LARVAE AND 2 SITES FOR ADULT TRAP	WEEKLY MONITORING FOR LARVAE. EVERY OTHER DAY FOR ADULTS BY TRAP HAULS (JUNE THROUGH NOVEMBER)	PARAMETERS -- LOBSTER, JONAH CRAB, AND ROCK CRAB ABUNDANCE (ADULTS AND LARVAE).	1978	ON-GOING	1

PROJID	CMS ELEMENT (SEE NOTES AT END)	PROJECT DESCRIPTION	MONITORING DESIGN (SEE NOTES AT END)	# SAMPLING STATIONS / YEAR	SAMPLING FREQUENCY	PARAMETERS	PROJECT START YEAR	PROJECT END YEAR (ALL DATA COLLECTED AND INPUT)	PRIORITY (SEE NOTES AT END)
SSFISH	1	THE OBJECTIVE OF THE FINFISH STUDIES AT SEABROOK STATION IS TO ASSESS WHETHER POWER PLANT OPERATION SINCE 1990 HAS HAD ANY MEASUREABLE EFFECT ON THE NEARSHORE FINFISH POPULATIONS.	1	3 OFFSHORE, 3 IN ESTUARY	1-2 SAMPLES PER MONTH FROM APRIL TO NOVEMBER.	PARAMETERS -- ICHTHYOPLANKTON AND FISH SPECIES (DEMERSAL AND ESTUARINE).	1976	ON-GOING	1
SSFLATS	1	THE PURPOSE OF THIS PROJECT IS TO PERIODICALLY MAP THE DIMENSIONS OF THE FIVE MAJOR CLAM FLATS IN HAMPTON HARBOR. THE DIMENSIONS ARE USED TO ESTIMATE THE STANDING CROP OF HARVESTABLE CLAMS IN HAMPTON HARBOR.	1	STATIONS -- THE FIVE MAJOR CLAM FLATS IN HAMPTON HARBOR.	APPROXIMATELY EVERY FIVE YEARS.	PARAMETERS -- SIZE OF THE CLAM FLATS IN ACRES. SAMPLING FREQUENCY -- APPROXIMATELY EVERY FIVE YEARS. THE FLATS HAVE BEEN MAPPED IN 1977, 1979, 1981, 1983, 1984, 1995, AND 2002. STATIONS -- THE FIVE MAJOR CLAM FLATS IN HAMPTON HARBOR. METHODS -- THE SIZE	1977	ON-GOING	1
SSZOOP	1	THE OBJECTIVE OF THIS PROGRAM IS TO WHETHER DIFFERENCES THAT EXIST AMONG ZOOPLANKTON COMMUNITIES AT NEARFIELD AND FARFIELD SITES IN THE HAMPTON-SEABROOK AREA CAN BE ATTRIBUTED TO THE OPERATION OF SEABROOK STATION.	1	COOLANT INTAKE AND FAR FIELD	2-4 TIMES PER WEEK FROM APRIL TO OCTOBER. STATIONS	PARAMETERS -- DENSITY OF BIVALVE LARVAE AND MACROZOOPLANKTON. SAMPLING FREQUENCY -- 2-4 TIMES PER WEEK FROM APRIL TO OCTOBER. STATIONS -- COOLANT INTAKE AND FAR FIELD . COMMENTS -- THE DES WATER QUALITY DATABASE DOES NOT CONTAIN ANY DATA FOR THIS PROJECT.	1978	ON-GOING	1
SUP_ADMIN	1	GENERAL ADMINISTRATIVE SUPPORT OF MONITORING PROGRAMS						ON-GOING	1
SUP_LIMNO	1	DOCUMENTATION OF RESOURCES NEEDED TO SUPPORT THE DES LIMNOLOGY LAB.					1990	ON-GOING	1

PROJID	CMS ELEMENT (SEE NOTES AT END)	PROJECT DESCRIPTION	MONITORING DESIGN (SEE NOTES AT END)	# SAMPLING STATIONS / YEAR	SAMPLING FREQUENCY	PARAMETERS	PROJECT START YEAR	PROJECT END YEAR (ALL DATA COLLECTED AND INPUT)	PRIORITY (SEE NOTES AT END)
VLAP	1	PHYSICAL, CHEMICAL AND BIOLOGICAL SAMPLING OF NH LAKES CONDUCTED BY EITHER DES STAFF OR VOLUNTEERS IN ASSOCIATION WITH THE DES VOLUNTEER LAKE ASSESSMENT PROGRAM. DES TIME ALSO INCLUDES FUTURE SUPPORT OF GLOBE AND ESTABLISHMENT OF A MONITORING NETWORK.	1	160 LAKES - FIXED STATIONS (AT DEEPEST POINT OF LAKE OR IN MULTIPLE BASINS ON LARGE LAKES, PLUS INLET TRIBUTARIES AND OUTLET). AVERAGE OF ABOUT 5 TO 6 STATIONS PER LAKE.	VARIES FROM 1 TO 6 X IN SUMMER WITH AVERAGE OF ~ 3 X IN SUMMER; EVERY YEAR	AT LAKE'S DEEPEST POINT: TRANSPARENCY, TURBIDITY, PH, CONDUCTIVITY, TOTAL PHOSPHORUS, ACID NEUTRALIZING CAPACITY, CHLOR A., D.O.(ONCE) AND PLANKTON HAUL (ONCE). AT TRIBUTARIES AND OUTLETS: TURBIDITY, PH, CONDUCTIVITY AND TOTAL PHOSPHORUS, FISH TISSUE.	1985	ON-GOING	1
VRAP	1	CHEMICAL, PHYSICAL, AND BACTERIOLOGICAL RIVER QUALITY SAMPLING CONDUCTED BY TRAINED VOLUNTEERS USING NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES EQUIPMENT AND EPA APPROVED PROTOCOLS (ANNUAL - TYPICALLY JUNE, JULY, AND AUGUST). DES TIME ALSO INCLUDES FUTURE SUPPORT OF GLOBE AND ESTABLISHMENT OF A MONITORING NETWORK.	1	0	0		1998	ON-GOING	1
0009TMDL	2	TMDL TO ADDRESS TASTE AND ODER PROBLEMS IN CANOBIE LAKE CAUSED BY ALGAL GROWTH. THE TMDL FOCUSES ON CONTROLLING TOTAL PHOSPHORUS (TP) TO LIMIT ALGAL GROWTH. THE QAPP, TMDL AND DATA COLLECTION WERE PAID FOR AND CONDUCTED BY THE TOWN OF SALEM. SALEM'S E	1	~ 5	YEAR ROUND	PHOSPHORUS, COLOR, BACTERIA, DISSOLVED OXGYEN	2004	2005	1

PROJID	CMS ELEMENT (SEE NOTES AT END)	PROJECT DESCRIPTION	MONITORING DESIGN (SEE NOTES AT END)	# SAMPLING STATIONS / YEAR	SAMPLING FREQUENCY	PARAMETERS	PROJECT START YEAR	PROJECT END YEAR (ALL DATA COLLECTED AND INPUT)	PRIORITY (SEE NOTES AT END)
ACOEMERR	2	COLLECT WATER QUALITY DATA TO ASSESS RIVER STATUS AND CALIBRATE COMPUTER SIMULATION MODEL.	1	NUMEROUS		DISSOLVED OXYGEN, NUTRIENTS, E. COLI	2002	2004	1
BIOSS001	2	ANALYZE STORM SAMPLES COLLECTED BY SILVER LAKE VOLUNTEERS (NOT A VLAP GROUP)	1	18	4 RAIN EVENTS	PH, CONDUCTIVITY AND TURBIDITY (BY DES LIMNO); TP AND TSS BY EASTERN ANALYTICAL (PAID BY VOLUNTEERS)	2005	ONGOING	1
BIOSS002	2	KEZAR LAKE - TP STORM SAMPLES TAKEN BY VOLUNTEERS TO DETERMINE IMPACT OF NEW DEVELOPMENTS	1	9	3	TP, SP COND, TURB, PH	1999	ON-GOING	1
CLIMATE	2	CLIMATE DATA FROM ESTABLISHED WEATHER STATIONS THROUGHOUT THE STATE. PRIMARILY TEMPERATURE AND PRECIPITATION.	1	NUMEROUS	YEAR ROUND	CLIMATE DATA	2002	ON-GOING	1
DEFENSE	2	TO OVERSEE THE CLEANUP OF FACILITIES CURRENTLY, OR FORMERLY, OWNED BY THE DEPARTMENT OF DEFENSE.	1				1993	ON-GOING	1
DMR	2	TO INCORPORATE SELF-MONITORING DATA FROM NPDES FACILITIES WHO ARE REQUIRED TO SAMPLE, ANALYZE, AND REPORT THE RESULTS OF CHEMICAL AND/OR BIOLOGICAL TESTING OF THEIR EFFLUENT.	1				1986	ON-GOING	1
GCNE	2	COMPLIANCE MONITORING FOR THE CONSTRUCTION AND OPERATION OF THE GOLF COURSE	1				2001	2007	1

PROJID	CMS ELEMENT (SEE NOTES AT END)	PROJECT DESCRIPTION	MONITORING DESIGN (SEE NOTES AT END)	# SAMPLING STATIONS / YEAR	SAMPLING FREQUENCY	PARAMETERS	PROJECT START YEAR	PROJECT END YEAR (ALL DATA COLLECTED AND INPUT)	PRIORITY (SEE NOTES AT END)
GEOGWRI	2	TO PROVIDE SOUTHEASTERN NEW HAMPSHIRE COMMUNITIES AND REGIONAL PLANNING AGENCIES WITH NEW TOOLS AND DATA NEEDED TO MAKE INFORMED DECISIONS ABOUT WATER AVAILABILITY AND USE, AND TO PLAN FOR FUTURE GROWTH IN THE REGION.	1				2002	2005	1
GMCGOLT	2	THE OSSIPEE LAKE TRIBUTARIES (OLT) PROJECT IS USED TO STUDY BASELINE DATA OF WATER QUALITY AND TRACK WATER QUALITY CHANGES IN THE OSSIPEE WATERSHED.	1				2003	ONGOING	1
GMCGRIV	2	THE REGIONAL INTERSTATE VOLUNTEERS FOR THE ECOSYSTEM AND RIVERS OF SACO (RIVERS) PROJECT IS USED TO STUDY BASELINE DATA OF WATER QUALITY AND TRACK WATER QUALITY CHANGES IN THE OSSIPEE WATERSHED.	1				2002	ONGOING	1
HWR/ORCB	2	SOIL, WATER, AND AIR SAMPLES FROM PETROLEUM AND HAZARDOUS WASTE CONTAMINATED SITES (INCLUDING FEDERAL LEAKING UNDERGROUND STORAGE TANK SITES).	1					ON-GOING	1
I93CHLOR	2	SAMPLING TO DETERMINE POTENTIAL IMPACT OF ROAD SALT ON CHLORIDE CONCENTRATIONS	1	NUMEROUS	MULTIPLE	PRIIMARILY CHLORIDES AND SPECIFIC CONDUCTANCE	2003	2005	1

PROJID	CMS ELEMENT (SEE NOTES AT END)	PROJECT DESCRIPTION	MONITORING DESIGN (SEE NOTES AT END)	# SAMPLING STATIONS / YEAR	SAMPLING FREQUENCY	PARAMETERS	PROJECT START YEAR	PROJECT END YEAR (ALL DATA COLLECTED AND INPUT)	PRIORITY (SEE NOTES AT END)
SBATMDL	2	THIS IS A SCREENING LEVEL DISSOLVED OXYGEN STUDYFOR THE TMDL PROGRAM . THE STUDY AREA ENCOMPASSES APPROXIMATELY 15 MILES OF RIVER FROM THE OUTLET OF FARRAR POND IN TROY TO THE CONFLUENCE WITH THE ASHULOT RIVER IN SWANZEY. THE FOCUS OF THE STUDY WILL BE	1				2004	2005	1
SUP_DATAQA	2	DATA MANAGEMENT EFFORTS ASSOCIATED WITH SOLICITING DATA FROM OUTSIDE AGENCIES AND ROUTINE QA/QC OF DATA IN DATABASE		VARIES WITH PROJECT	VARIES WITH PROJECT	VARIES WITH PROJECT	2002	ON-GOING	1
SUP_DBDEV	2	DATA MANAGEMENT EFFORTS ASSOCIATED WITH MODIFICATIONS/IMPROVEMENTS OF MONITORING DATABASE TO MEET USER NEEDS.					2002	ON-GOING	1
SUPERFND	2	TO OVERSEE AND MANAGE THE CLEANUP OF SUPERFUND SITES.						ON-GOING	1
UMMP	2	BIOASSESSMENTS OF UPPER MERRIMACK RIVER CORRIDOR AND INCORPORATION OF DATA BY NHDES FOR 305(B) REPORTING. EDUCATIONAL AND OUTREACH OF WATERSHED STAKEHOLDERS IS ALSO A PRIMARY OBJECTIVE/PURPOSE.	1					ON-GOING	1
UNHLLMP	2	LAY LAKES	1					ON-GOING	1

PROJID	CMS ELEMENT (SEE NOTES AT END)	PROJECT DESCRIPTION	MONITORING DESIGN (SEE NOTES AT END)	# SAMPLING STATIONS / YEAR	SAMPLING FREQUENCY	PARAMETERS	PROJECT START YEAR	PROJECT END YEAR (ALL DATA COLLECTED AND INPUT)	PRIORITY (SEE NOTES AT END)
USNIOMP	2	TO DETERMINE OCCURRENCE OF TOXIC CONTAMINANTS IN SEDIMENT AND MUSSEL TISSUE	1	14 SITES IN "AREAS OF CONCERN" NEAR PNSY, 4 REFERENCE SITES IN THE PISCATAQUA RIVER, BACK CHANNEL, AND SAGAMORE CREEK. COMM	EVERY FIVE YEARS	PARAMETERS -- METALS, PAHS, PCBS, AND PESTICIDES IN SEDIMENT AND MUSSEL TISSUE.	2000	ON-GOING	1
SUP_ASSMT1	3	ASSESSMENT OF WATER QUALITY DATA FOR 305(B)/303(D) REPORTING. INCLUDES MAINTENANCE OF THE EPA ASSESSMENT DATABASE, UPDATING THE CONSOLIDATED ASSESSMENT METHODOLOGY, MAINTENANCE OF GIS (ASSESSMENT UNITS AND NATIONAL HYDROGRAPHY DATASET).		N/A	NA	N/A	2004	ON-GOING	1

NOTES:

1. CMS ELEMENT KEY: 1 = MONITORING ANDQUALITY ASSURANCE, 2 = DATA MANAGEMENT, 3 = ASSESSMENTS/REPORTING
2. MONITORING OBJECTIVE KEY: 0 = OBJECTIVE DOES NOT APPLY, 1 = PRIMARY OBJECTIVE, 1 = SECONDARY OBJECTIVE.
3. PRIORITY KEY: 1 = HIGH, 2 = MEDIUM, 3 = LOW

TABLE 4.2: MONITORING OBJECTIVES AND APPLICABLE WATERBODY TYPES FOR EACH PROJECT

PROJID	CMS ELEMENT (SEE NOTES BELOW)	OBJ 1.	OBJ 2.	OBJ 3.	OBJ 4.	OBJ 5.	OBJ 6.	OBJ 7.	OBJ 8.	OBJ 9.	OBJ 10.	OBJ 11.	OBJ 12.	LAKE	IMPOUND-MENT	RIVERINE IMPOUND-MENT	RIVER	WETLAND-FRESH WATER	WETLAND-MARINE WATER	ESTUARY	OCEAN	BEACH-FRESH WATER	BEACH-MARINE WATER
		(SEE NOTES BELOW FOR MONITORING OBJECTIVE KEY)												(SEE NOTES BELOW FOR WATERBODY TYPE KEY)									
401CERT	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	1	1	1	1
ACIDOUT	1	0	2	1	2	0	2	0	0	0	2	0	0	1	0	0	0	0	0	0	0	0	0
ACIDREM	1	0	2	1	2	0	2	0	0	0	2	0	0	1	0	0	0	0	0	0	0	0	0
ARMP	1	0	1	2	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
BEACH	1	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
CLNLKPER	1	0	0	0	1	2	0	0	0	0	2	0	2	2	0	0	0	0	0	0	0	0	0
COASTINV	1	0	1	0	0	2	2	2	2	0	0	0	0	1	1	1	1	1	1	1	1	1	1
COASTRES	1	0	1	0	0	2	2	2	2	0	2	0	0	0	1	1	1	0	0	1	0	0	0
COMPLAIN	1	0	2	0	0	2	0	0	1	0	0	0	0	1	1	1	1	0	0	1	1	0	0
CSI	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
E_ARMP_BIO	1	0	1	1	0	0	1	1	1	1	0	0	1	0	0	0	1	0	0	0	0	0	0
E_BCHTMDL	1	0	2	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0

PROJID	CMS ELEMENT (SEE NOTES BELOW)	OBJ 1.	OBJ 2.	OBJ 3.	OBJ 4.	OBJ 5.	OBJ 6.	OBJ 7.	OBJ 8.	OBJ 9.	OBJ 10.	OBJ 11.	OBJ 12.	LAKE	IMPOUND-MENT	RIVERINE IMPOUND-MENT	RIVER	WETLAND-FRESH WATER	WETLAND-MARINE WATER	ESTUARY	OCEAN	BEACH-FRESH WATER	BEACH-MARINE WATER
E_CLNLK	1	0	0	0	1	2	0	0	0	0	2	0	2	1	1	0	0	0	0	0	0	0	0
E_COCHBIO	1	0	2	0	0	0	2	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
E_EXOTICS	1	0	2	0	0	0	1	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0
E_EXRBIO	1	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
E_FISHHG	1	0	2	2	0	0	1	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0
E_SHELLEMRG	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0
E_SHELLPOST	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0
E_SHELLSTU	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0
E_SHELLTIS	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0
E_SLTMSH	1	0	0	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
EELGRASS	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
FGFFISH	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
FGHERRIN	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
FGLOBJUV	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0
FGLOBSEA	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0

PROJID	CMS ELEMENT (SEE NOTES BELOW)	OBJ 1.	OBJ 2.	OBJ 3.	OBJ 4.	OBJ 5.	OBJ 6.	OBJ 7.	OBJ 8.	OBJ 9.	OBJ 10.	OBJ 11.	OBJ 12.	LAKE	IMPOUND-MENT	RIVERINE IMPOUND-MENT	RIVER	WETLAND-FRESH WATER	WETLAND-MARINE WATER	ESTUARY	OCEAN	BEACH-FRESH WATER	BEACH-MARINE WATER
FGOYSHAR	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
FGOYSMSX	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
FGOYSRES	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
FGSHAD	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
FGSMELT	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
FGWFOWL	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
GBCWHAB	1	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0
GBCWTWQ	1	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0
GULFWTCH	1	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
JELSND	1	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
JELTWQ	1	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
LKTROPH	1	0	1	2	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
MERRINV	1	0	1	0	0	2	2	2	2	0	0	0	0	1	1	1	1	1	1	1	1	1	1
MRFSS	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0
N_NUTPERI	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PROJID	CMS ELEMENT (SEE NOTES BELOW)	OBJ 1.	OBJ 2.	OBJ 3.	OBJ 4.	OBJ 5.	OBJ 6.	OBJ 7.	OBJ 8.	OBJ 9.	OBJ 10.	OBJ 11.	OBJ 12.	LAKE	IMPOUND-MENT	RIVERINE IMPOUND-MENT	RIVER	WETLAND-FRESH WATER	WETLAND-MARINE WATER	ESTUARY	OCEAN	BEACH-FRESH WATER	BEACH-MARINE WATER
N_PBM1	1	1	2	0	0	0	0	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0
N_PBM2	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
N_TAROC1	1	2	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
N_TMDLCHL	1	0	2	0	1	2	1	0	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0
N_TMDLES1	1	0	2	0	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
N_TMDLR1	1	0	2	0	1	2	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
N_WQSDEV	1	0	0	0	0	0	0	0	0	1	2	0	2	1	1	1	1	0	0	1	1	1	1
NADP	1	0	0	1	0	2	2	0	0	0	2	0	0	1	1	1	1	1	1	1	1	1	1
NCAPBM	1	1	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
NCASED	1	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0
NCATWQ	1	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
NERRSND	1	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
NERRTWQ	1	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
NERRWWS	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
NHEPOYS	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0

PROJID	CMS ELEMENT (SEE NOTES BELOW)	OBJ 1.	OBJ 2.	OBJ 3.	OBJ 4.	OBJ 5.	OBJ 6.	OBJ 7.	OBJ 8.	OBJ 9.	OBJ 10.	OBJ 11.	OBJ 12.	LAKE	IMPOUND-MENT	RIVERINE IMPOUND-MENT	RIVER	WETLAND-FRESH WATER	WETLAND-MARINE WATER	ESTUARY	OCEAN	BEACH-FRESH WATER	BEACH-MARINE WATER
NHEPTWQ	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
NMFS	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0
NOAANST	1	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
SHELLDRY	1	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0
SHELLPSP	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0
SHELLRMP	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0
SHELLSUR	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
SHELLWET	1	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0
SSBETHOS	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0
SSCLAM	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0
SSCRUST	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0
SSFISH	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0
SSFLATS	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0
SSZOOP	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0
SUP_ADMIN	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PROJID	CMS ELEMENT (SEE NOTES BELOW)	OBJ 1.	OBJ 2.	OBJ 3.	OBJ 4.	OBJ 5.	OBJ 6.	OBJ 7.	OBJ 8.	OBJ 9.	OBJ 10.	OBJ 11.	OBJ 12.	LAKE	IMPOUND-MENT	RIVERINE IMPOUND-MENT	RIVER	WETLAND-FRESH WATER	WETLAND-MARINE WATER	ESTUARY	OCEAN	BEACH-FRESH WATER	BEACH-MARINE WATER
SUP_LIMNO	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VLAP	1	0	2	1	0	2	2	0	0	0	0	0	2	1	1	0	0	0	0	0	0	0	0
VRAP	1	0	2	1	0	2	2	0	0	0	0	0	2	0	0	1	1	0	0	0	0	0	0
0009TMDL	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ACOEMERR	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
BIOSS001	2	0	1	0	0	2	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
BIOSS002	2	0	1	0	0	2	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
CLIMATE	2	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DEFENSE	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	1	1	0	0
DMR	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GCNE	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GEOGWRI	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GMCGOLT	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
GMCGRIV	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HWR/ORCB	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

PROJID	CMS ELEMENT (SEE NOTES BELOW)	OBJ 1.	OBJ 2.	OBJ 3.	OBJ 4.	OBJ 5.	OBJ 6.	OBJ 7.	OBJ 8.	OBJ 9.	OBJ 10.	OBJ 11.	OBJ 12.	LAKE	IMPOUND-MENT	RIVERINE IMPOUND-MENT	RIVER	WETLAND-FRESH WATER	WETLAND-MARINE WATER	ESTUARY	OCEAN	BEACH-FRESH WATER	BEACH-MARINE WATER
I93CHLOR	2	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SBATMDL	2	0	2	0	1	2	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
SUP_DATAQA	2													1	1	1	1	1	1	1	1	1	1
SUP_DBDEV	2													0	0	0	0	0	0	0	0	0	0
SUPERFND	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
UMMP	2	0	1	2	0	2	2	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
UNHLLMP	2	0	2	1	0	2	2	0	0	0	0	0	2	1	1	0	0	0	0	0	0	0	0
USNIOMP	2	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	0
SUP_ASSMT1	3													1	1	1	1	1	1	1	1	1	1

NOTES:

1. CMS ELEMENT KEY: 1 = MONITORING AND QUALITY ASSURANCE, 2 = DATA MANAGEMENT, 3 = ASSESSMENTS/REPORTING
2. MONITORING OBJECTIVE KEY: 0 = OBJECTIVE DOES NOT APPLY, 1 = PRIMARY OBJECTIVE, 1 = SECONDARY OBJECTIVE.
3. WATERBODY TYPE KEY: 0 = NOT APPLICABLE, 1 = APPLICABLE

TABLE 4.3: STAFF AND FUNDING NEEDS

PROJID	CMS ELE-MENT	YR 1: TOTAL COSTS	YR 1: AVAILABLE FUNDING	YR 1: SURPLUS OR DEFICIT	YR 1 : TOTAL # FTES	YR 1 : # EXIST-ING FTES	YR 1 : # NEW FTES REQUI-RED	YR 2: TOTAL COSTS	YR 2: AVAILABLE FUNDING	YR 2: SURPLUS OR DEFICIT	YR 2 : TOTAL # FTES	YR 2 : # EXIST-ING FTES	YR 2 : # NEW FTES REQUI-RED	PEAK YR: TOTAL COSTS	PEAK YR: AVAILABLE FUNDING	PEAK YR: SURPLUS OR DEFICIT	PEAK YR : TOTAL # FTES	PEAK YR : # EXIST-ING FTES	PEAK YR : # NEW FTES REQUI-RED
401CERT	1	$9,096	$9,096	$0	0.100	0.100	0.000	$9,306	$9,096	($210)	0.100	0.100	0.000	$9,096	$9,096	$0	0.100	0.100	0.000
ACIDOUT	1	$19,007	$19,007	($0)	0.120	0.120	0.000	$19,551	$19,007	($544)	0.120	0.120	0.000	$19,007	$19,007	($0)	0.120	0.120	0.000
ACIDREM	1	$10,608	$10,608	($0)	0.040	0.040	0.000	$10,900	$10,608	($292)	0.040	0.040	0.000	$10,608	$10,608	($0)	0.040	0.040	0.000
ARMP	1	$134,269	$134,269	($0)	1.200	0.500	0.700	$138,672	$134,269	($4,403)	1.200	0.500	0.700	$205,455	$134,269	($71,186)	2.200	0.500	1.700
BEACH	1	$215,122	$215,122	($0)	2.700	2.100	0.600	$227,357	$215,122	($12,235)	2.700	2.100	0.600	$231,692	$215,122	($16,570)	2.700	2.100	0.600
CLNLKPER	1	$9,339	$9,339	$0	0.050	0.050	0.000	$0	$9,339	$9,339	0.000	0.000	0.000	$9,339	$9,339	$0	0.050	0.050	0.000
COASTINV	1	$74,265	$74,265	$0	0.850	0.750	0.100	$75,903	$74,265	($1,638)	0.850	0.750	0.100	$74,265	$74,265	$0	0.850	0.750	0.100
COASTRES	1	$55,201	$55,201	($0)	0.330	0.330	0.000	$56,864	$55,201	($1,663)	0.330	0.330	0.000	$59,701	$55,201	($4,500)	0.330	0.330	0.000
COMPLAIN	1	$27,575	$27,575	($0)	0.150	0.150	0.000	$28,399	$27,575	($824)	0.150	0.150	0.000	$27,575	$27,575	($0)	0.150	0.150	0.000
CSI	1	$131,174	$131,174	($0)	1.500	1.500	0.000	$134,036	$131,174	($2,862)	1.500	1.500	0.000	$131,174	$131,174	($0)	1.500	1.500	0.000
E_ARMP_BIO	1	$113,930	$113,930	($0)	1.250	0.750	0.500	$117,066	$113,930	($3,136)	1.250	0.750	0.500	$172,230	$113,930	($58,300)	2.150	0.750	1.400
E_BCHTMDL	1	$4,038	$4,038	($0)	0.050	0.050	0.000	$0	$0	$0	0.000	0.000	0.000	$4,038	$4,038	($0)	0.050	0.050	0.000

PROJID	CMS ELE-MENT	YR 1: TOTAL COSTS	YR 1: AVAILABLE FUNDING	YR 1: SURPLUS OR DEFICIT	YR 1 : TOTAL # FTES	YR 1 : # EXIST-ING FTES	YR 1 : # NEW FTES REQUI-RED	YR 2: TOTAL COSTS	YR 2: AVAILABLE FUNDING	YR 2: SURPLUS OR DEFICIT	YR 2 : TOTAL # FTES	YR 2 : # EXIST-ING FTES	YR 2 : # NEW FTES REQUI-RED	PEAK YR: TOTAL COSTS	PEAK YR: AVAILABLE FUNDING	PEAK YR: SURPLUS OR DEFICIT	PEAK YR : TOTAL # FTES	PEAK YR : # EXIST-ING FTES	PEAK YR : # NEW FTES REQUI-RED
E_CLNLK	1	$80,276	$80,276	$0	1.050	0.750	0.300	$82,327	$80,276	($2,051)	1.050	0.750	0.300	$156,856	$80,276	($76,580)	2.050	0.750	1.300
E_COCHBIO	1	$30,839	$30,839	($0)	1.000	0.200	0.800	$0	$0	$0	0.000	0.000	0.000	$0	$30,839	$30,839	0.000	0.000	0.000
E_EXOTICS	1	$35,604	$35,604	($0)	0.340	0.340	0.000	$36,543	$35,604	($939)	0.340	0.340	0.000	$35,604	$35,604	($0)	0.340	0.340	0.000
E_EXRBIO	1	$32,384	$32,384	$0	0.100	0.100	0.000	$33,786	$0	($33,786)	0.100	0.100	0.000	$32,384	$32,384	$0	0.100	0.100	0.000
E_FISHHG	1	$15,479	$15,479	$0	0.200	0.200	0.000	$15,846	$15,479	($367)	0.200	0.200	0.000	$15,479	$15,479	$0	0.200	0.200	0.000
E_SHELLEMRG	1	$11,832	$11,832	($0)	0.100	0.100	0.000	$12,200	$4,320	($7,880)	0.100	0.100	0.000	$11,832	$11,832	($0)	0.100	0.100	0.000
E_SHELLPOST	1	$12,072	$12,072	($0)	0.100	0.100	0.000	$12,452	$12,072	($380)	0.100	0.100	0.000	$12,072	$12,072	($0)	0.100	0.100	0.000
E_SHELLSTU	1	$9,672	$9,672	($0)	0.100	0.100	0.000	$9,932	$9,672	($260)	0.100	0.100	0.000	$9,672	$9,672	($0)	0.100	0.100	0.000
E_SHELLTIS	1	$13,212	$13,212	($0)	0.100	0.100	0.000	$13,649	$13,212	($437)	0.100	0.100	0.000	$13,212	$13,212	($0)	0.100	0.100	0.000
E_SLTMSH	1	$76,030	$76,030	($0)	1.130	1.130	0.000	$77,555	$76,030	($1,525)	1.130	1.130	0.000	$76,030	$76,030	($0)	1.130	1.130	0.000
EELGRASS	1	$842	$842	$0	0.010	0.010	0.000	$859	$842	($17)	0.010	0.010	0.000	$842	$842	$0	0.010	0.010	0.000
FGFFISH	1	$337	$337	$0	0.004	0.004	0.000	$343	$337	($6)	0.004	0.004	0.000	$337	$337	$0	0.004	0.004	0.000
FGHERRIN	1	$337	$337	$0	0.004	0.004	0.000	$343	$337	($6)	0.004	0.004	0.000	$337	$337	$0	0.004	0.004	0.000
FGLOBJUV	1	$337	$337	$0	0.004	0.004	0.000	$343	$337	($6)	0.004	0.004	0.000	$337	$337	$0	0.004	0.004	0.000

PROJID	CMS ELE-MENT	YR 1: TOTAL COSTS	YR 1: AVAILABLE FUNDING	YR 1: SURPLUS OR DEFICIT	YR 1 : TOTAL # FTES	YR 1 : # EXIST-ING FTES	YR 1 : # NEW FTES REQUI-RED	YR 2: TOTAL COSTS	YR 2: AVAILABLE FUNDING	YR 2: SURPLUS OR DEFICIT	YR 2 : TOTAL # FTES	YR 2 : # EXIST-ING FTES	YR 2 : # NEW FTES REQUI-RED	PEAK YR: TOTAL COSTS	PEAK YR: AVAILABLE FUNDING	PEAK YR: SURPLUS OR DEFICIT	PEAK YR : TOTAL # FTES	PEAK YR : # EXIST-ING FTES	PEAK YR : # NEW FTES REQUI-RED
FGLOBSEA	1	$337	$337	$0	0.004	0.004	0.000	$343	$337	($6)	0.004	0.004	0.000	$337	$337	$0	0.004	0.004	0.000
FGOYSHAR	1	$337	$337	$0	0.004	0.004	0.000	$343	$337	($6)	0.004	0.004	0.000	$337	$337	$0	0.004	0.004	0.000
FGOYSMSX	1	$337	$337	$0	0.004	0.004	0.000	$343	$337	($6)	0.004	0.004	0.000	$337	$337	$0	0.004	0.004	0.000
FGOYSRES	1	$337	$337	$0	0.004	0.004	0.000	$343	$337	($6)	0.004	0.004	0.000	$337	$337	$0	0.004	0.004	0.000
FGSHAD	1	$337	$337	$0	0.004	0.004	0.000	$343	$337	($6)	0.004	0.004	0.000	$337	$337	$0	0.004	0.004	0.000
FGSMELT	1	$337	$337	$0	0.004	0.004	0.000	$343	$337	($6)	0.004	0.004	0.000	$337	$337	$0	0.004	0.004	0.000
FGWFOWL	1	$337	$337	$0	0.004	0.004	0.000	$343	$337	($6)	0.004	0.004	0.000	$337	$337	$0	0.004	0.004	0.000
GBCWHAB	1	$29,321	$29,321	$0	0.055	0.055	0.000	$30,658	$5,500	($25,158)	0.055	0.055	0.000	$29,321	$29,321	$0	0.055	0.055	0.000
GBCWTWQ	1	$30,772	$30,772	$0	0.075	0.075	0.000	$32,138	$6,500	($25,638)	0.075	0.075	0.000	$30,772	$30,772	$0	0.075	0.075	0.000
GULFWTCH	1	$27,925	$27,925	$0	0.230	0.230	0.000	$28,699	$27,925	($774)	0.230	0.230	0.000	$27,925	$27,925	$0	0.230	0.230	0.000
JELSND	1	$4,318	$4,318	$0	0.050	0.050	0.000	$4,406	$4,318	($88)	0.050	0.050	0.000	$4,318	$4,318	$0	0.050	0.050	0.000
JELTWQ	1	$3,472	$3,472	($0)	0.040	0.040	0.000	$3,544	$3,472	($72)	0.040	0.040	0.000	$3,472	$3,472	($0)	0.040	0.040	0.000
LKTROPH	1	$147,043	$147,043	($0)	1.800	1.500	0.300	$155,730	$147,043	($8,687)	1.800	1.500	0.300	$150,923	$147,043	($3,880)	1.800	1.500	0.300
MERRINV	1	$32,355	$32,355	($0)	0.550	0.300	0.250	$33,110	$32,355	($755)	0.550	0.300	0.250	$32,355	$32,355	($0)	0.550	0.300	0.250

PROJID	CMS ELE-MENT	YR 1: TOTAL COSTS	YR 1: AVAILABLE FUNDING	YR 1: SURPLUS OR DEFICIT	YR 1 : TOTAL # FTES	YR 1 : # EXIST-ING FTES	YR 1 : # NEW FTES REQUI-RED	YR 2: TOTAL COSTS	YR 2: AVAILABLE FUNDING	YR 2: SURPLUS OR DEFICIT	YR 2 : TOTAL # FTES	YR 2 : # EXIST-ING FTES	YR 2 : # NEW FTES REQUI-RED	PEAK YR: TOTAL COSTS	PEAK YR: AVAILABLE FUNDING	PEAK YR: SURPLUS OR DEFICIT	PEAK YR : TOTAL # FTES	PEAK YR : # EXIST-ING FTES	PEAK YR : # NEW FTES REQUI-RED
MRFSS	1	$337	$337	$0	0.004	0.004	0.000	$343	$337	($6)	0.004	0.004	0.000	$337	$337	$0	0.004	0.004	0.000
N_NUTPERI	1	$42,227	$42,227	$0	1.050	0.150	0.900	$0	$0	$0	0.000	0.000	0.000	$42,227	$42,227	$0	1.050	0.150	0.900
N_PBM1	1	$0	$0	$0	0.000	0.000	0.000	$0	$0	$0	0.000	0.000	0.000	$109,902	$0	($109,902)	1.200	0.200	1.000
N_PBM2	1	$0	$0	$0	0.000	0.000	0.000	$0	$0	$0	0.000	0.000	0.000	$105,830	$0	($105,830)	1.200	0.100	1.100
N_TAROC1	1	$0	$0	$0	0.000	0.000	0.000	$0	$0	$0	0.000	0.000	0.000	$5,453	$0	($5,453)	0.035	0.035	0.000
N_TMDLCHL	1	$152,528	$152,528	($0)	0.030	0.030	0.000	$241	$0	($241)	0.004	0.004	0.000	$152,654	$152,528	($126)	0.060	0.060	0.000
N_TMDLES1	1	$0	$0	$0	0.000	0.000	0.000	$0	$0	$0	0.000	0.000	0.000	$32,504	$0	($32,504)	0.150	0.150	0.000
N_TMDLR1	1	$64,822	$64,822	($0)	0.900	0.400	0.500	$66,470	$64,822	($1,648)	0.900	0.400	0.500	$139,902	$64,822	($75,080)	1.900	0.400	1.500
N_WQSDEV	1	$0	$0	$0	0.000	0.000	0.000	$0	$0	$0	0.000	0.000	0.000	$61,842	$0	($61,842)	1.100	0.100	1.000
NADP	1	$337	$337	$0	0.004	0.004	0.000	$343	$337	($6)	0.004	0.004	0.000	$337	$337	$0	0.004	0.004	0.000
NCAPBM	1	$17,390	$17,390	$0	0.200	0.200	0.000	$17,746	$17,390	($356)	0.200	0.200	0.000	$17,390	$17,390	$0	0.200	0.200	0.000
NCASED	1	$337	$337	$0	0.004	0.004	0.000	$343	$337	($6)	0.004	0.004	0.000	$337	$337	$0	0.004	0.004	0.000
NCATWQ	1	$4,318	$4,318	$0	0.050	0.050	0.000	$4,406	$4,318	($88)	0.050	0.050	0.000	$4,318	$4,318	$0	0.050	0.050	0.000
NERRSND	1	$4,318	$4,318	$0	0.050	0.050	0.000	$4,406	$4,318	($88)	0.050	0.050	0.000	$4,318	$4,318	$0	0.050	0.050	0.000

PROJID	CMS ELE-MENT	YR 1: TOTAL COSTS	YR 1: AVAILABLE FUNDING	YR 1: SURPLUS OR DEFICIT	YR 1 : TOTAL # FTES	YR 1 : # EXIST-ING FTES	YR 1 : # NEW FTES REQUI-RED	YR 2: TOTAL COSTS	YR 2: AVAILABLE FUNDING	YR 2: SURPLUS OR DEFICIT	YR 2 : TOTAL # FTES	YR 2 : # EXIST-ING FTES	YR 2 : # NEW FTES REQUI-RED	PEAK YR: TOTAL COSTS	PEAK YR: AVAILABLE FUNDING	PEAK YR: SURPLUS OR DEFICIT	PEAK YR : TOTAL # FTES	PEAK YR : # EXIST-ING FTES	PEAK YR : # NEW FTES REQUI-RED
NERRTWQ	1	$4,318	$4,318	$0	0.050	0.050	0.000	$4,406	$4,318	($88)	0.050	0.050	0.000	$4,318	$4,318	$0	0.050	0.050	0.000
NERRWWS	1	$337	$337	$0	0.004	0.004	0.000	$343	$337	($6)	0.004	0.004	0.000	$337	$337	$0	0.004	0.004	0.000
NHEPOYS	1	$337	$337	$0	0.004	0.004	0.000	$241	$337	$96	0.004	0.004	0.000	$236	$337	$101	0.004	0.004	0.000
NHEPTWQ	1	$337	$337	$0	0.004	0.004	0.000	$241	$337	$96	0.004	0.004	0.000	$236	$337	$101	0.004	0.004	0.000
NMFS	1	$337	$337	$0	0.004	0.004	0.000	$241	$337	$96	0.004	0.004	0.000	$236	$337	$101	0.004	0.004	0.000
NOAANST	1	$337	$337	$0	0.004	0.004	0.000	$241	$337	$96	0.004	0.004	0.000	$236	$337	$101	0.004	0.004	0.000
SHELLDRY	1	$7,870	$7,870	$0	0.100	0.100	0.000	$8,072	$7,870	($202)	0.100	0.100	0.000	$7,870	$7,870	$0	0.100	0.100	0.000
SHELLPSP	1	$18,872	$18,872	($0)	0.100	0.100	0.000	$19,592	$18,872	($720)	0.100	0.100	0.000	$18,872	$18,872	($0)	0.100	0.100	0.000
SHELLRMP	1	$93,311	$93,311	$0	0.650	0.650	0.000	$96,300	$89,029	($7,271)	0.650	0.650	0.000	$93,311	$93,311	$0	0.650	0.650	0.000
SHELLSUR	1	$0	$0	$0	0.000	0.000	0.000	$0	$0	$0	0.000	0.000	0.000	$33,543	$0	($33,543)	0.200	0.200	0.000
SHELLWET	1	$7,870	$7,870	$0	0.100	0.100	0.000	$8,072	$7,870	($202)	0.100	0.100	0.000	$7,870	$7,870	$0	0.100	0.100	0.000
SSBETHOS	1	$337	$337	$0	0.004	0.004	0.000	$241	$337	$96	0.004	0.004	0.000	$236	$337	$101	0.004	0.004	0.000
SSCLAM	1	$337	$337	$0	0.004	0.004	0.000	$241	$337	$96	0.004	0.004	0.000	$236	$337	$101	0.004	0.004	0.000
SSCRUST	1	$337	$337	$0	0.004	0.004	0.000	$241	$337	$96	0.004	0.004	0.000	$236	$337	$101	0.004	0.004	0.000

PROJID	CMS ELE-MENT	YR 1: TOTAL COSTS	YR 1: AVAILABLE FUNDING	YR 1: SURPLUS OR DEFICIT	YR 1 : TOTAL # FTES	YR 1 : # EXIST-ING FTES	YR 1 : # NEW FTES REQUI-RED	YR 2: TOTAL COSTS	YR 2: AVAILABLE FUNDING	YR 2: SURPLUS OR DEFICIT	YR 2 : TOTAL # FTES	YR 2 : # EXIST-ING FTES	YR 2 : # NEW FTES REQUI-RED	PEAK YR: TOTAL COSTS	PEAK YR: AVAILABLE FUNDING	PEAK YR: SURPLUS OR DEFICIT	PEAK YR : TOTAL # FTES	PEAK YR : # EXIST-ING FTES	PEAK YR : # NEW FTES REQUI-RED
SSFISH	1	$337	$337	$0	0.004	0.004	0.000	$241	$337	$96	0.004	0.004	0.000	$236	$337	$101	0.004	0.004	0.000
SSFLATS	1	$337	$337	$0	0.004	0.004	0.000	$241	$337	$96	0.004	0.004	0.000	$236	$337	$101	0.004	0.004	0.000
SSZOOP	1	$337	$337	$0	0.004	0.004	0.000	$241	$337	$96	0.004	0.004	0.000	$236	$337	$101	0.004	0.004	0.000
SUP_ADMIN	1	$57,243	$57,243	$0	0.600	0.600	0.000	$58,467	$57,243	($1,224)	0.600	0.600	0.000	$57,243	$57,243	$0	0.600	0.600	0.000
SUP_LIMNO	1	$35,167	$35,167	$0	0.500	0.200	0.300	$36,167	$35,167	($1,000)	0.500	0.200	0.300	$88,075	$35,167	($52,908)	1.500	0.200	1.300
VLAP	1	$98,784	$98,784	($0)	1.600	1.100	0.500	$100,876	$98,784	($2,092)	1.600	1.100	0.500	$206,889	$98,784	($108,105)	2.600	1.100	1.500
VRAP	1	$152,922	$152,922	($0)	2.500	2.000	0.500	$156,136	$152,922	($3,214)	2.500	2.000	0.500	$260,079	$152,922	($107,157)	3.500	2.000	1.500
SUBTOTAL	1	**$2,167,112**	**$2,167,120**	**$8**	**23.946**	**17.696**	**6.250**	**$1,990,060**	**$1,845,217**	**($144,843)**	**21.770**	**17.220**	**4.550**	**$3,058,734**	**$2,167,120**	**($891,614)**	**33.761**	**18.311**	**15.450**
SUP_DATAQA	2	$60,604	$60,604	$0	0.890	0.890	0.000	$61,860	$61,860	($0)	0.890	0.890	0.000	$179,693	$60,604	($119,089)	2.890	0.890	2.000
SUP_DBDEV	2	$162,134	$162,134	($0)	1.650	1.650	0.000	$165,508	$162,134	($3,374)	1.650	1.650	0.000	$162,134	$162,134	($0)	1.650	1.650	0.000
SUBTOTAL	2	**$222,738**	**$222,738**	**$0**	**2.540**	**2.540**	**0.000**	**$227,368**	**$223,994**	**($3,374)**	**2.540**	**2.540**	**0.000**	**$341,827**	**$222,738**	**($119,089)**	**4.540**	**2.540**	**2.000**
SUP_ASSMT1	3	**$137,456**	**$137,456**	**($0)**	**1.550**	**1.550**	**0.000**	**$140,314**	**$137,456**	**($2,858)**	**1.550**	**1.550**	**0.000**	**$212,971**	**$137,456**	**($75,515)**	**2.550**	**1.550**	**1.000**

PROJID	CMS ELE-MENT	YR 1: TOTAL COSTS	YR 1: AVAILABLE FUNDING	YR 1: SURPLUS OR DEFICIT	YR 1 : TOTAL # FTES	YR 1 : # EXIST-ING FTES	YR 1 : # NEW FTES REQUI-RED	YR 2: TOTAL COSTS	YR 2: AVAILABLE FUNDING	YR 2: SURPLUS OR DEFICIT	YR 2 : TOTAL # FTES	YR 2 : # EXIST-ING FTES	YR 2 : # NEW FTES REQUI-RED	PEAK YR: TOTAL COSTS	PEAK YR: AVAILABLE FUNDING	PEAK YR: SURPLUS OR DEFICIT	PEAK YR : TOTAL # FTES	PEAK YR : # EXIST-ING FTES	PEAK YR : # NEW FTES REQUI-RED
GRAND TOTAL	1,2,3	$2,527,306	$2,527,314	$8	28.036	21.786	6.250	$2,357,742	$2,206,667	($151,075)	25.860	21.310	4.550	$3,613,533	$2,527,314	($1,086,219)	40.851	22.401	18.450

NOTES:

1. CMS ELEMENT KEY: 1 = MONITORING AND QUALITY ASSURANCE, 2 = DATA MANAGEMENT, 3 = ASSESSMENTS/REPORTING
2. 2. YR 1 = 2006, YR 2 = 2007, PEAK YR = ESTIMATED MAXIMUM ANNUAL COSTS AND FTES IN NEXT 10 YEARS (IN 2005 DOLLARS)
3. CMS ELEMENT 1: COSTS INCLUDE DES STAFF TIME AND RELATED COSTS ASSOCIATED WITH PLANNING, COLLECTING SAMPLES, QA/QC OF DATA AND INPUT INTO DES DATABASE
4. CMS ELEMENT 2: COSTS INCLUDE DES STAFF TIME AND RELATED COSTS ASSOCIATED WITH ROUTING QA/QC OF DATA IN THE DES DATABASE AS WELL AS SOLICITING DATA FROM OUTSIDE GROUPS AND INPUT INTO THE DES DATABASE.
5. CMS ELEMENT 3: COSTS INCLUDE DES STAFF TIME ASSOCIATED WITH 305(B)/303(D) ASSESSMENTS AND REPORTING.
6. COSTS DO NOT INCLUDE OFFICE SPACE FOR NEW STAFF.